A window open on the world

The UNESCO Courier

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Where the Dead Sea Scrolls left off

Early Christian manuscripts from the sands of the Nile

Photo © Uffizi Gallery, Florence

Katharina, aged 20

Painter, engraver and draughtsman, the great German artist Albrecht Dürer was born exactly five centuries ago. The drawing, above, of a Moorish girl was made in 1521 when Dürer journeyed to the Netherlands to be present at the coronation of the young emperor Charles V. "I painted the Moorish girl with my pencil," he noted in his diary, referring to his silver point sketch on specially prepared paper or parchment, for which he was already famous throughout Europe. Dürer committed the girl's name and age to eternity, noting "1521, Katharina, aged 20" alongside his familiar monogram.

TREASURES OF WORLD ART

55 ***Germany***

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'Katharina, aged 20', by Albrecht Dürer (Germany)

Photo © Desjardins - Réalités

Cover

These fragments of ancient Coptic script are from the papyrus pages of some 50 works discovered in upper Egypt. Scholars expect this "library" of 400 A.D. will throw new light on early Christianity and particularly on the doctrines of the Gnostics (see article page 4). Inset, villagers of a Coptic Christian community not far from the site where the manuscripts were found.

UNESCO ARCHIVES

Where the Dead Sea Scrolls left off

EARLY CHRISTIAN MANUSCRIPTS FROM THE SANDS OF THE NILE

by James M. Robinson

Sometime around 400 A. D., thirteen books were buried in Upper Egypt, to be dug up by pure chance a generation ago. This invaluable little library is now to be published in a facsimile edition by the United Arab Republic in co-operation with Unesco. Nothing is directly known about who buried the library. In fact, very little is known about who discovered it. But the generally accepted assumptions run somewhat as follows:

Jean Doresse, then a member of the Institute of Oriental Archaeological Studies (today a noted French historian of religion and specialist on Ethiopia), had initiative enough to track down the site of the find, some twenty years ago, when the library had only recently surfaced on the antiquities market of Cairo. After their purchase in 1951 by the Egyptian Government, the manuscripts were placed in the Coptic Museum in Cairo, and Jean Doresse was commissioned by the Museum to investigate the discovery.

He equipped himself out for a minor desert safari, and after various adventures, including being hospitalized from the bite of a wild dog, he reached what seems to have been the place of burial: a cemetery from Roman times near the modern town of Nag Hammadi (about two-thirds the way upstream from Cairo to Luxor), quite close to the small village of Hamra Dom.

This cemetery was located in a strip of desert only some one hundred metres wide, running between the green vegetation nurtured by the Nile and a vertical cliff. At the foot of the cliff are masses of fallen stones, forming an irregular inclined plane which one can scramble up from the desert floor to the face of the cliff some ten metres above the flat sand below.

At this accessible height on the face of the cliff artificial caves had been cut about the time of the Sixth Dynasty. Some were never completed, others were used for burials, and one contains the kind of relief sculpture and painting typical of Pharaonic tombs. But all had been looted in antiquity, so that by the fourth century A.D. they were merely a row of cool caves, ideal for hermit habitation.

Evidence that they must have in fact functioned as the cells of monks is supplied in the form of rather crude red painting on the walls. Some caves have large crosses. One has a long text, listing by number and opening lines a series of Old Testament psalms, perhaps to remind the monk which psalm came next as he mumbled them in his devotions. One cave contained an ascription of praise to Zeus Sarapis, indicative of a non-Christian (or at least a not-just-Christian) holy man.

Monks inhabiting these caves would look out over the cemetery in the sand below, where their own burial might some day take place. There are instances of venerated persons being buried with a book, just as possessions were more customarily buried with the owner in antiquity than today. One might also think, in analogy to the situation with the Dead Sea Scrolls, that the books may have been buried for safe keeping, when persecution descended upon the monks and extinction became imminent.

As a matter of fact several references in the books themselves could have suggested such an idea, for several of the documents purport to be antediluvian revelations inscribed on stone or hid in a high mountain so

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JAMES M. ROBINSON *is head of the Institute of Antiquity and Christianity at Claremont Graduate School in California (U.S.A.). He served as secretary of the U.A.R.-Unesco International Committee for the Nag Hammadi Codices which met in Cairo last December. Under his direction, an international team of scholars is working on the English language publication of the Nag Hammadi codices with the help of grants from the National Endowment for the Humanities.*

The 13 volumes of Coptic texts, found near the town of Nag Hammadi in Egypt, in 1945, contain about 1,000 pages of which nearly 800 are intact. For four years, an international committee of scholars, appointed by Unesco and the United Arab Republic, sifted painstakingly through the jumbled fragments of the damaged pages (left). Worms had eaten "inlets" and "bays" into the papyrus so that it was a matter of placing "peninsulas" and "islands" in the correct relation to each other. Identification was usually based on translation, and the conjectural filling in of the letters in an "inlet" or "lake" of missing papyrus.

Photo Unesco

that in the latter days the chosen race would gain access to that primal revelation—which was in effect a literary fiction for legitimizing the speculations the "revelations" contained.

Such a time of persecution may have taken place late in the fourth century. By this time the Roman Empire was officially Christian, and this meant orthodoxically Christian. Bishops could and did have condemnations of heretical views read in all churches and monasteries, and the efficiency of Roman provincial government could put teeth in such denunciations.

It so happens that precisely the same little bend in the Nile that makes of the Nag Hammadi district a bigger arable area than usual was the place where, toward the middle of the fourth century, the whole monastic movement of Christianity was first launched. Pachomius was a young monk who first brought individual hermit monks together into a communal life or monastery.

With the passing of time these monasteries, built in the lush green habitable area, might seem all too comfortable, too "worldly", compared to the more austere solitary-confinement life of the venerated saints of yesteryear. Such an idea might be triggered by evidence that the big-city clergy was getting control over the monks, and even branding as heretical some of the more spiritualistic of them —for the library does represent a more spiritualistic, other-wordly religiosity than was typical of orthodox Christianity.

What would be more natural, under such circumstances, than to withdraw —voluntarily or involuntarily — and go back to the desert cliff's caves, distant from the "flesh pots of Egypt". And such "heretical" monks might well have taken with them the all-too-spiritualistic, "heretical" books which inspired them.

Such a mock-up of the situation in which the library was buried is mere conjecture, but does seem more probable than other hypotheses, for example that the library was brought together not by a heretical group, but by an orthodox heresy-hunter both seeking documentation for his polemics and seeking to get the dangerous literature out of circulation. The standard way of getting rid of banned books was to burn them whereas burying in a jar was in antiquity usually a form of preservation.

One reason we know so little directly about who buried the library is that whoever used and ultimately

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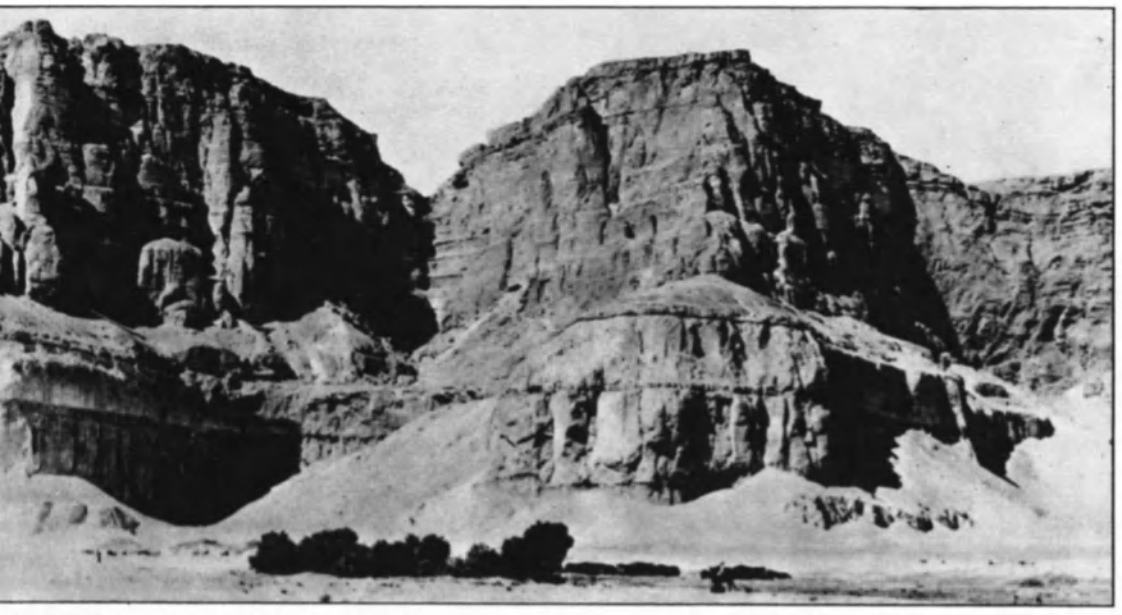

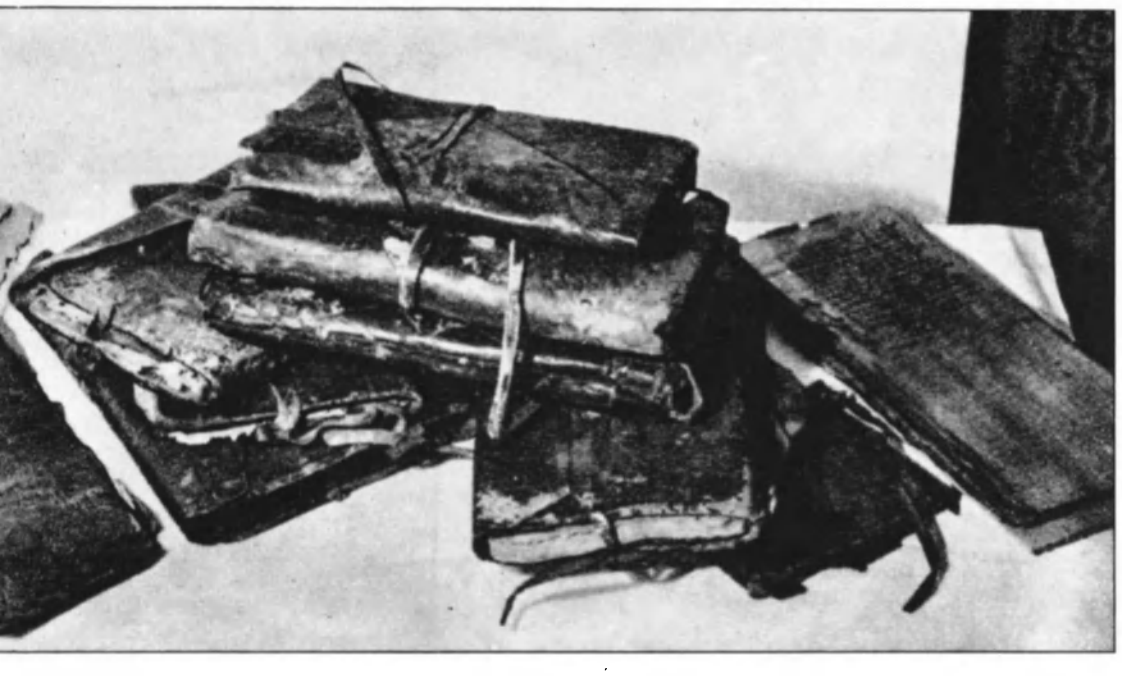

Left, this forbidding cliff face, near Nag Hammadi on a bend in the Nile, housed a community of cave-dwelling monks during the 4th century A.D. In the ancient cemetery at the foot of the cliffs Arab workmen unearthed a jar in which a library of bound manuscripts had lain for some 16 centuries. Eleven volumes still retain their original form, their pages being clipped together and enclosed in soft leather bindings with triangular flaps and secured with leather thongs, below left. With the exception of one codex (right of photo) which is longer and narrower, the books measure 25 to 27 cms by 15 cms. Right, the Codex which begins with a text entitled "The Acts of Peter". The feather between these pages is one of several found in the work. These "bookmarks" show that this was evidently the volume most often referred to by the monks.

COPTIC MANUSCRIPTS *(Continued)*

buried it was not the same as those who wrote it. Five or ten different scribes were involved in copying out the surviving thirteen books. Only rarely did more than one scribe work on one book. So we need not assume all thirteen books were copied by one and the same group.

In fact, there is reason to think the library was not originally conceived of as a set, but rather was originally a series of independent volumes or smaller clusters of volumes. For two different dialects occur, suggesting a few of the thirteen books came from a different region from the others. And the fact that multiple copies of the same work occur in different books suggests they were not originally in the same library.

For example, the Bible has only one copy of each work. No one book in the Nag Hammadi library has more than one copy of a document, which suggests a similar reticence to produce duplicates. In fact, one scribal note expresses anxiety lest the scribe copy something that would be a duplicate.

Furthermore, all the instances of duplicates are quite different in their wording, so that it is clear one did not copy from the other, nor did two copy from a same non-surviving copy. They worked independently. Apparently a series of individual books were handed down to a single individual or group, only then becoming a library.

Each book is actually a volume of collected essays, which do not come from the *same* author—or even the same time or place. Actually, the library, now in the Coptic language, seems to have been all translated from Greek (Coptic is the language derived from the ancient Egyptian language, using Greek letters).

The translators seem even less unified than the scribes. For if a single scribe usually copied out a whole book, the individual essays in a given book seem to have been translated usually by different persons. Thus behind the thirteen books copied by a handful of scribes usually working independently we light upon over fifty essays usually translated by a still larger number of individuals.

When one then moves a step still further back, to the Greek originals, we have to do with almost fifty independent essays (when one substracts doublets). To be sure, one can identify clusters that share a common point of view, and even seek to identify such a cluster with a heretical group such as the Valentinians or Sethians about whom we know from other sources.

But what we know from such other sources is so scant that it is almost like clarifying light by darkness, to use them to explain the library. It is more likely to turn out the other way around: the Nag Hammadi library will be the light helping us understand the out-of-context quotes, wilful caricatures and defamations, and veiled allusions found in orthodox polemics.

Photos © Jean Doresse, Paris

As a matter of fact, the two most important values of the library for our historical understanding today lie intertwined right here. Of course the library has increased tremendously our available source materials—in all by something over a thousand pages. And hence the knowledge of these off-beat movements will be immeasurably increased. But this new knowledge will also reflect new light on orthodox Christianity, with which much of it was in debate.

For example, Nag Hammadi documents not only quote the New Testament in line with their own views, and claim Jesus and the apostles for their side of the argument; they do in fact in some cases prove to have carried on, even if in a exaggerated or distorted way, primitive Christian traditions that gradually disappeared from orthodox Christianity... perhaps because such ideas had ended up in heresy.

Where this leaves us is, for example, with a New Testament that is not nearly as orthodox as the church fathers who collected it into the canon thought it to be. Some of the New Testament books seemed almost as readily to point to the other outcome. One reason the church fathers may have had for including in the New Testament some of the latest canonical books is that these late works in effect superimposed upon the earlier books and traditions (such as Jesus' sayings, Paul's letters, the Gospel of John) an unambiguously orthodox interpretation for it was precisely they to whom the heretics appealed.

Thus what at first sight seemed a dusty archaeological find from a rather obscure time and place, at least as far as the average person is concerned, and written in a language most readers have hardly heard of, turns out to be a whole library of some fifty works; part of the Greek language literature from which most of our classical heritage stems; written in various parts of the ancient world, from Egypt to Syria; and covering a time span reaching back into New Testament times, picking up the story of off-beat sects about where the Dead Sea Scrolls leave off.

For if the latest of the Scrolls would be near to 70 AD, when the Essene monastery was wiped out in the Jewish revolt, the earliest Nag Hammadi text to be dated thus far ("The Revelation of Adam") is dated in the first century B.C. or A.D. And, just as the Dead Sea Scrolls document an off-beat Judaism later weeded out, the Nag Hammadi library not only documents off-beat Christianity, but also off-beat Judaism.

Indeed, the shift from "scroll"—a book in the form of a long roll—to "codex"—a book in the form of pages as we use today—is typical of the transition from the "Dead Sea Scrolls" to the "Nag Hammadi Codices".

In fact, the library is now seen to be much more varied than was originally supposed. It is usually called "gnostic"—the name of a spiritualistic,

CONTINUED NEXT PAGE

speculative, other-worldly religiosity that swept the ancient world in early Christian times. One used to think of Gnosticism as a distortion of Christianity, that is to say, as of Christian origin, essentially a Christian heresy. More recent study had already argued that Gnosticism was much more widespread and probably in its origin too early for such a derivation. And the Nag Hammadi library tends to confirm this more recent theory.

This is especially true of the part of the library that has not yet been published. For it so happens that what has been published thus far, by coincidence and perhaps in part because of its particular interest, has been largely Christian gnostic in type. But this impression will change when the bulk of the library, not yet generally accessible, is made available through the facsimile edition being prepared by the U.A.R.-Unesco International Committee for the Nag Hammadi Codices.

THIS project, first envisaged by Unesco in 1961-62, is now approaching its realization. Prior to the involvement of Unesco, about half the library was assigned out by the Cairo Coptic Museum to individual translators, a good part of which has by now been published, so that something like a third of the whole is already available in published translations.

Unesco's intention has been to publish photographs of all the pages, so that all qualified scholars can work on the materials simultaneously. Photographs were taken between 1962-66 through the good offices of the Documentation and Study Centre for the History of the Art and Civilization of Ancient Egypt (set up in 1955 by the U.A.R., helped by Unesco).

But since hundreds of fragments were unidentified and unassembled, many of these photographs, though of good quality technically, were not in the form in which they should be published. The fragments should, to the extent possible, be identified and reassembled, and new photographs made of the newly assembled pages.

Over the past four years, several institutes in the U.A.R., U.S.A., Switzerland, Fed. Rep. of Germany, France, etc., painstakingly sifted through the jumbled fragments on the basis of photographs and transcriptions, and identified a large number of the fragments.

This was usually not possible simply on the basis of fitting contours, as one does a jig-saw puzzle. For the worms ate "inlets" and "bays" into the papyrus. so that it was a matter of placing "peninsulas" and "islands" in the correct relation to each other.

This would have been relatively

CONTINUED PAGE 10

A B P A C A Δ A B P A
A B P A C A Δ A B P
A B P A C A Δ A B
A B P A C A Δ A
A B P A C A Δ
A B P A C A
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A B P A
A B P
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A

ABRACADABRA

The word "abracadabra" that nowadays signifies "hocus-pocus", "an incantation", "gibberish", has come down to us from the Gnostics who used it as a magic formula to ward off disease or misfortune. According to the Gnostic physician Quintus Serenus Samonicus, it was to be set down as a mystical design by dropping a letter on each line (above). Hung as a talisman around the neck it was said to be a charm against fevers and other agues. The word is supposed to be derived from 'abraxas' the Gnostic designation of the Supreme Power. This drawing with its ancient spelling was made by Dom Bertrand de Montfaucon in his 18th century treatise, "Antiquity Explained and Depicted".

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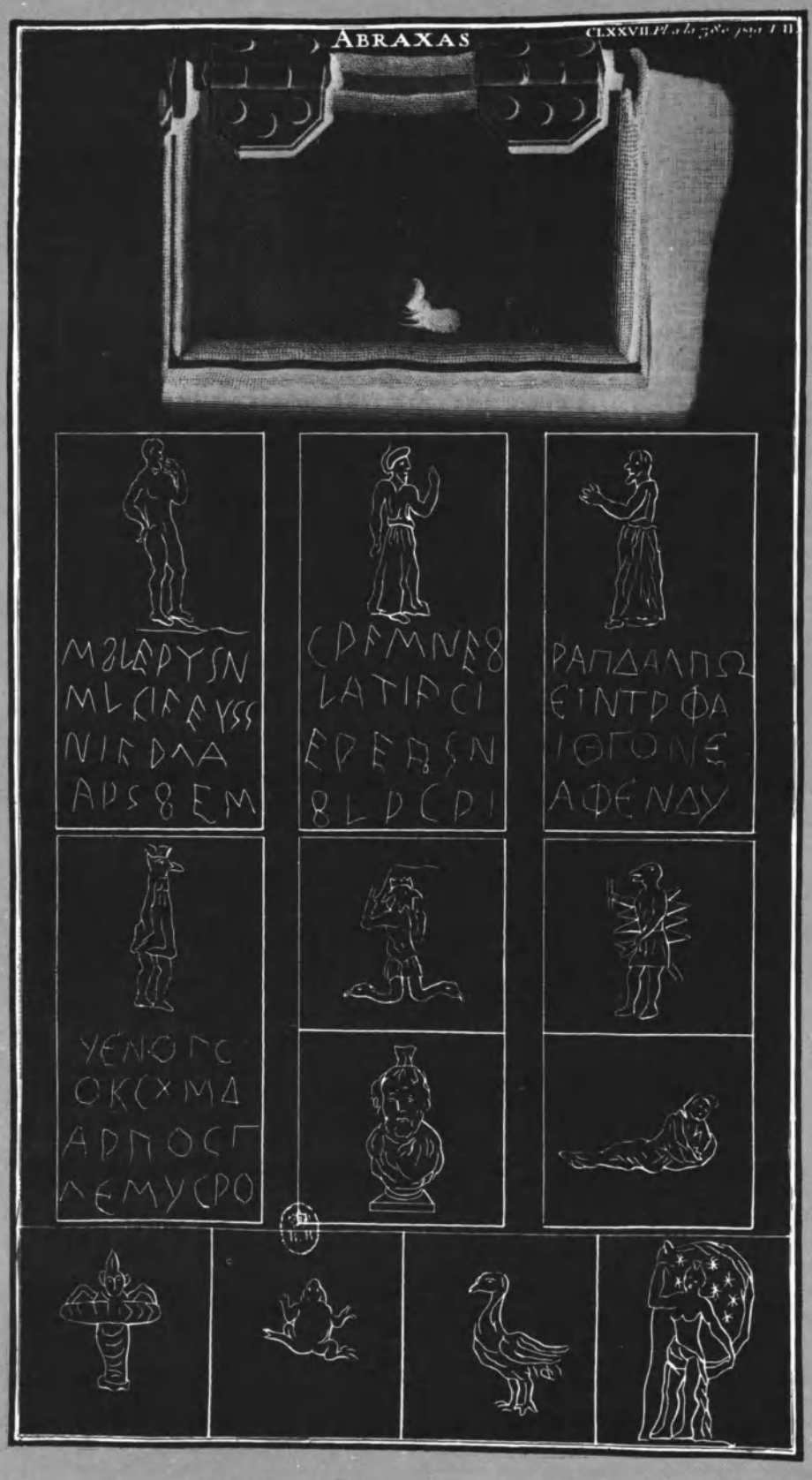
THE RIDDLE OF THE 'ABRAXAS' AMULETS

The new light thrown on Gnostic symbolism by the discovery of the Nag Hammadi manuscripts may help to solve the riddle of the strange Abraxas stones. Over the centuries these stone medallions with their cabalistic carvings, the work of Basilidian Gnostics, have been found in their thousands in Egypt, Rome and the Mediterranean world. For some Gnostics 'Abraxas' meant God. The letters of the word in Greek notation make up the number 365, the number of days in a year. Sun worship, widespread in ancient Egypt, remained closely linked with certain forms of Christian Gnosticism. Winged figures (1 and 7) probably represent the sun. The serpent holding its tail in its mouth is an ancient symbol both for the sun and for eternity. In the finely carved scene (2) two riders flank a star-spangled figure and the serpent symbol is again repeated. An angel or a cherub (3) sitting on a lotus flower is the sign of the goddess Isis. The scarab (4) represented the sun for the ancient Egyptians. Many abraxas in the form of scarabs have been found. Some, like the one here, have ribbons over the eyes showing they were intended to be worn round the neck. The cabalistic writing on the clothing of the figure (5) are prayers or protective incantations. (6) A creature half man, half snake. (8) Lion eating a bee. The lion was both the sun symbol of Mithraism and the symbol of Christ for the early Christians. (9) Water flowing from a vase or canope topped with the head of the Egyptian god Osiris. (10) Creature with the head of a cock and snakes for legs.



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BOOK OF LEAD. Scholars are puzzled by most of the mysterious symbols on the 'abraxas' (left). In 1719, Dom Bernard de Montfaucon, of the Benedictine Order, a great Orientalist of his time, described the symbols in great detail in his five-volume work, 'L'Antiquité Expliquée et Représentée en Figures' (Antiquity Explained and Depicted). All the drawings on these two pages are taken from Dom Bernard's work. The drawings shown above illustrated the 12 pages of a small Gnostic book discovered by Dom Bernard in Rome in 1699. Measuring 7 cm. by 10 cm., this remarkable little book was made entirely of lead—pages, binding, hinges and nails to hold them. The inscriptions on the first four pages are written in Etruscan and Greek letters, but are still undeciphered. According to Dom Bernard, the figures represent the hours of the day. The seventh hour is portrayed by Serapis, a Greek solar deity adopted by the Egyptians.

easy, if the original papyrus had been available. But it was put in safe keeping and had not been available since. Hence identification was usually based on translation, and the conjectural filling-in of the letters in an "inlet" or "lake" of missing papyrus.

Often the contours of the "peninsulas" or "islands" on one page, whose identity was certain, would provide the basis for placing fragments with almost identical contours on the preceding and succeeding pages. The outcome of combining such methods was a relatively high degree of certainty in identifying many fragments.

The results of this painstaking work were tabulated on conversion tables, which listed each fragment by the number of the photograph and its position on the photograph, and, beside that numeration, gave the original Coptic page number and position on that page. This would make it possible, in theory or in the abstract, to "convert" from the unordered status of materials on the photographs to a reconstruction of the original page sequences and fragment positions.

WHAT remained to be done of course was to move from theory to practice. When the International Committee for the Nag Hammadi Codices, convened by the Egyptian authorities with Unesco's aid, met in Cairo, on December 15-18, 1970, one of its recommendations was that a technical sub-committee be designated to take the conversion tables that had been put at the committee's disposal and reassemble the actual papyrus fragments themselves.

The facsimile edition is planned to appear in eight volumes. Those books which have been inaccessible thus far will be published first, so that the scholarly world can move promptly toward publishing translations of them. The facsimile edition should be completely published by 1973.

Meanwhile a complete English edition is being prepared and will appear in five volumes. French and German translations, which have been ahead of English translations in the parts previously published, will also follow soon upon the appearance of the facsimile edition.

An open-ended series of volumes interpreting the significance of the Nag Hammadi library had also been recently launched, at the meeting of the International Association for the History of Religions in August, 1970 at Stockholm.

Thus the 1970s will be a decade in which "Nag Hammadi studies" (to make use of the title of this series of volumes) will be a very active and important area of research, bringing to light what was in effect a hippie-like movement in our cultural past. ■

Below, a Coptic Christian community in present-day Egypt not far from the site at which the Nag Hammadi library was found. There are today some 1,200,000 members of the Coptic Church in Egypt and a further 3,500,000 in Ethiopia. Right, the last of the 114 sayings attributed to Christ in the "Gospel according to Thomas". The text shown here reads: "Simon Peter said to them, 'Let Mary go out from among us, because women are not worthy of the Life.' Jesus said, 'See I shall lead her so that I will make her male, that she too may become a living spirit, resembling you males. For every woman who makes herself male will enter the Kingdom of Heaven'."

Photo M. Desjardins © Réalités, Paris

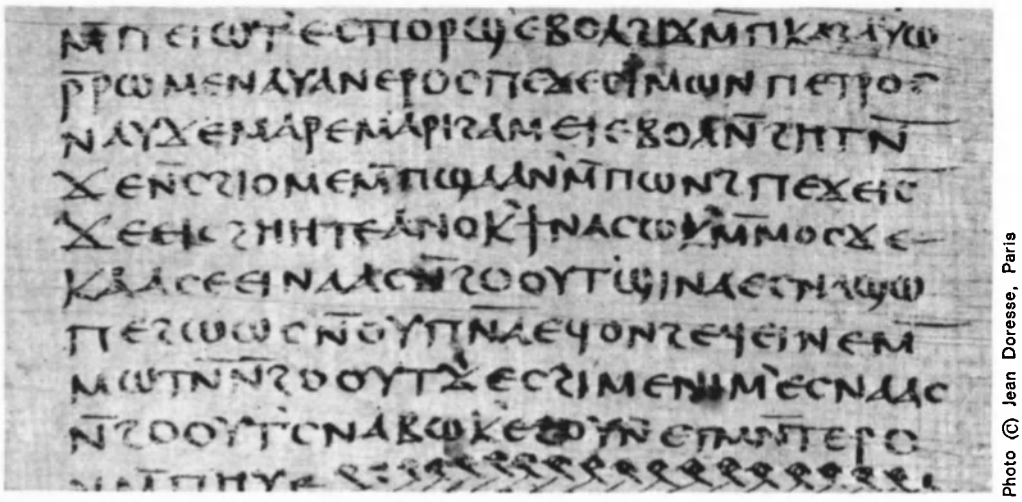

Photo © Jean Doresse, Paris

Coptic voices from the past

THE last half century has been rich in discoveries of priceless, historic manuscripts. The Dead Sea Scrolls enriched enormously our knowledge of the Essenes, who might be described as a "pre-Gnostic" Jewish sect; the seven volumes of Manichaean writings found in the El Fayum region of Egypt, in 1930, threw new light on the dualistic Gnosticism of the Persian Mani; the Greek texts found not far from Cairo, in 1941, clarified our knowledge of the thought of the great Christian Gnostic Origen.

Rivalling all these in importance, the Nag Hammadi codices, first discovered in 1945, are now to be published in full for the first time by Unesco, in collaboration with the government of the United Arab Republic. These Codices enable us to view the doctrines of the Gnostics as seen through their own eyes and permit us to trace the evolution of a movement which has had a marked influence on many religions of the world.

This was explained by Mr. Henri-Charles Puech, an eminent French authority on the history of religions, and Professor James Robinson, Secretary of the United Arab Republic-Unesco International Committee for the Nag Hammadi Codices, at a press conference given at Unesco headquarters in Paris, earlier this year.

The scribes who some sixteen centuries ago bent with loving and painstaking care over the thirteen volumes of the Nag Hammadi texts, said Mr. Puech, belonged to a community of Gnostics that flourished in Egypt during the first centuries after the birth of Christ.

Even the specialists find it difficult to define Gnosticism with any precision. The movement was responsible for many of the heresies of early Christianity, although it is now generally thought to ante-date Christianity. Mr. Puech described it as "a current of religious thought that attached itself to Christianity as it did to other Mediterranean and Middle Eastern religions".

Many early Christian theologians, such as Valentius, Clement and Origen, were Gnostics and their thinking had considerable effect on orthodox Christian thought. They attempted to combine Christian beliefs with others derived from Oriental and Greek sources, especially those that were mystical or metaphysical in nature such as the doctrines of Plato and Pythagoras.

The Greek word "gnosis" from which the name of the sect derives, was taken as meaning not "knowledge" as we understand it, but "revelation". To the Gnostics the purpose of life was ultimate personal salvation and much of their literature consisted of apocalyptic writings.

The Nag Hammadi texts are written in various dialects of the Coptic Language but using Greek characters. It will be several years yet before their full significance is known. However, the findings already announced are enough to whet the appetite for more.

Of all the texts so far examined, the "Apocryphon (or secret book) of John" is, according to Mr. Puech, of the greatest importance. It takes the form of a visionary account of the revelation made by Christ after the Passion to the apostle John. In it all kinds of religious mysteries are unveiled—the creation of the world, the fashioning of the first man, the future of souls, etc.

The "Book of the Holy Spirit" is also revelational in character as is the "Gospel of Truth" which is thought to have been written by Valentius himself in the middle of the second century. A.D. There is a double interest in this "Gospel" since it throws light on orthodox early Christian dogma as well as on the thinking which led to the Valentian version of Gnosticism.

OF equal importance is the "Gospel according to St. Thomas" which begins with the words, "These are the sayings of the Living Christ which were written down by Didymus Jude Thomas".

The text consists of over a hundred sayings of Christ, many of which were previously unknown. Some of the sayings recorded are variants of sayings that appear in the accepted gospels and are of great interest to scholars since the variations often conform to tradition as expressed in Syriac manuscripts. Each saying, therefore, raises fascinating problems of authenticity. The famous Oxyrhynchus papyrus, published at the beginning of this century, is probably a version in Greek of the same text with some variations.

Five of the Nag Hammadi texts are in the form of epistles, including one from "Peter to Philip, his elder brother and companion".

It would be almost impossible to over-estimate the importance of the Nag Hammadi texts. In the words of Mr. Puech, "The discovery of the Nag Hammadi library heralds a complete re-appraisal of our knowledge of Gnosticism. Before these texts became available, our knowledge, at least of early Christian Gnosticism, was based on indirect evidence and writings about heresies which were often both over-simplified and hostile. We now have at our disposal an abundance of authentically Gnostic texts which in number, scope and quality far surpass the few later Gnostic texts in the Coptic language previously available to us."

H. B.

The International Centre for Theoretical Physics, operated jointly by the International Atomic Energy Agency and Unesco, is housed on the Adriatic coast outside Trieste in this $2 million building (above) donated by the Italian government. The Trieste centre, a meeting place for minds, has neither cyclotrons nor other impressive-looking machines. Each year, over 500 scientists, mostly from the developing countries, make use of its facilities which include lectures in the amphitheatre (opposite) by some of the "greats" of modern physics.

TRIESTE— WORLD RENDEZVOUS FOR PHYSICISTS

by Dan Behrman

Photos Dominique Roger - Unesco

EVERY year, some five hundred of the world's brightest young minds in science are exposed to the International Centre for Theoretical Physics, a rather unusual United Nations institution on the Adriatic coast of Italy just outside Trieste. Most of these scientists come from developing countries and, under ordinary circumstances, they would be likely candidates for the brain drain.

This is precisely why the Trieste centre is in operation with the joint support of two U.N. agencies, the International Atomic Energy Agency and Unesco, and the Italian government. As a way out of the intellectual isolation that drives young scientists to emigrate, it offers them training, an opportunity to do research at regular intervals and, most of all, a place to think, talk and work.

From this scientific centre where chalk, blackboards and desks are the only visible apparatus, come more than 130 papers every year in the basic fields of elementary particles, high-energy physics, field theory, nuclear physics, solid state physics and plasma physics.

The centre serves to link east and west as well as the developed and the developing worlds. Research workshops have brought together the top people in the United States and the U.S.S.R. on many topics and particularly plasma physics where problems related to the domestication of the thermonuclear energy of the hydrogen bomb are being studied. If they can be solved, the world will be presented with a new source of power, pollution-free and well-nigh inexhaustible.

Yet the pursuit of theoretical physics cannot be justified in terms of its immediate applications. It is the most philosophical of sciences for it is concerned with the study of the very nature of matter. As such, it attracts the most talented brains of the developing world, the Einsteins, the Fermis, the Niels Bohrs of tomorrow and the day after. They will not devise ways to build better mousetraps but they learn to think in terms of original solutions. If they are not given the chance to work in contact with others at their own level, they languish... and they leave.

Such was the experience of the founder and director of the Trieste centre, Prof. Abdus Salam. It might even be said that it sprang from his own life, from the isolation that he himself suffered when, after taking his doctorate at Cambridge and conducting research in Princeton, he returned home to Pakistan to teach in 1951.

"I was the only theoretical physicist in the country at that time", he told me as I sat in his office sharing his lunch of sesame seeds. "The nearest one was in Bombay. You have no idea of what than can be like. A theoretical physicist has got to be able to talk, to discuss, to shout if need be.

"I remember, I received a cable one day from Wolfgang Pauli, the Nobel laureate from Zurich, who was in Bombay. He said he was alone and he wanted me to come to talk to him. So I took a plane to Bombay and a taxi to his hotel. I went up to his room, I knocked on the door.

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DAN BEHRMAN *is a Unesco science writer. He is the author of "The New World of the Oceans" (Little Brown and Co., Boston, U.S.A.), also recently published in a paperback edition.*

The micro-macro world under one roof

"He told me to come in and then, without a word of greeting, he said to me:

"'The problem is, if we have derivative terms in Schwinger's action principle...'"

Prof. Salam was called into an adjoining office for a moment and I had a chance to take in his surroundings. On one wall hung a framed 16th century prayer in Persian which, he had told me, invoked the name of Allah to ask for a miracle. A typewritten notice had been slipped under the glass top of his desk:

"Reminder: Mornings to be spent on physics: No visitors—No phone calls—No mail (except personal) before noon—Administrative matters and visitors during the period after lunch until 4 p.m. only. Remaining time to be spent on physics."

Also under glass on a wall to the right of the desk was a quotation: "We have all of us to preserve our competence in our own professions, to preserve what we know intimately, to preserve our mastery. This is, in fact, our only anchor in honesty."

Prof. Salam might have written that himself, but it was signed by the late Robert Oppenheimer, one of the earliest supporters of the Trieste centre. "The day that a director of a research centre like this one stops being a scientist, he's useless," Prof. Salam remarked. "Any fool can administer. People forget that they were made heads of centres because they were doing good science. So they lose their competence, they become manipulators of men just to keep themselves in power."

The entire full-time professional staff of the centre could fit into a small Fiat or a short sentence: Prof. Salam, the director; Prof. Paolo Budini from Italy, deputy director; and Dr. André Hamende, a Belgian, who is everything else. At Trieste, Parkinson's Law has been repealed. The administrative staff has actually dwindled from five to three since the centre opened in 1964 but the number of scientists it reaches every year has more than quintupled.

THE International Centre for Theoretical Physics does all this on a budget of no more than $600,000 a year. Of this figure, the biggest chunk is a generous $250,000 grant from the Italian govenrment which also financed the construction of its $2 million building. Then the International Atomic Energy Agency and Unesco each give $150,000. The remainder is made up mainly of contributions from the Swedish International Development Authority and the Ford Foundation.

This sum covers virtually all expenses from fellowships and publications to heating and administration: Included is the operation of the centre's library with 6,000 volumes and an up-to-date reference section of journals. The output in physics is so great today that one American journal alone runs to eighteen volumes in a single year.

This all began in 1960 when Prof. Salam was a member of the Pakistani delegation to the General Conference of the International Atomic Energy Agency in Vienna. He has always had a great gift for doing a number of things all at once: even today, he is still science adviser to the President of Pakistan and professor of theoretical physics at the Imperial College of Science and Technology in London along with his tasks in Trieste. Commuting between such jobs would numb an ordinary man, but Prof. Salam claims it enhances his productivity.

As a delegate in Vienna, he put forth the idea of an international centre for theoretical physics. "I was naive then, I wouldn't dare do it today. People took it half-jokingly and many delegations abstained on the vote when it was approved for a preliminary study. I found out that the idea interested the poor countries. What I wanted to do was to give the poor a place of their own where they would not have to beg anybody. Why shouldn't a bright youngster in Pakistan have the right to receive the same stimulating atmosphere as an Englishman or an American, provided be deserves it?"

His proposal got over the first hurdle in 1960. It was helped over the succeeding ones by Prof. Salam's fortuitous meeting with Prof. Budini at a

Pencils, paper and conversation are the working tools of the theoretical physicist. Left, three Asian scientists studying a problem are (left to right) M. Tint from Burma, I.T. Cheon from the Republic of Korea and M. Rahman from Pakistan. Right, Dr. V.K. Samaranyake of Ceylon (on right) and Dr. Ottaviani of Italy compare journals in the Trieste Centre library.

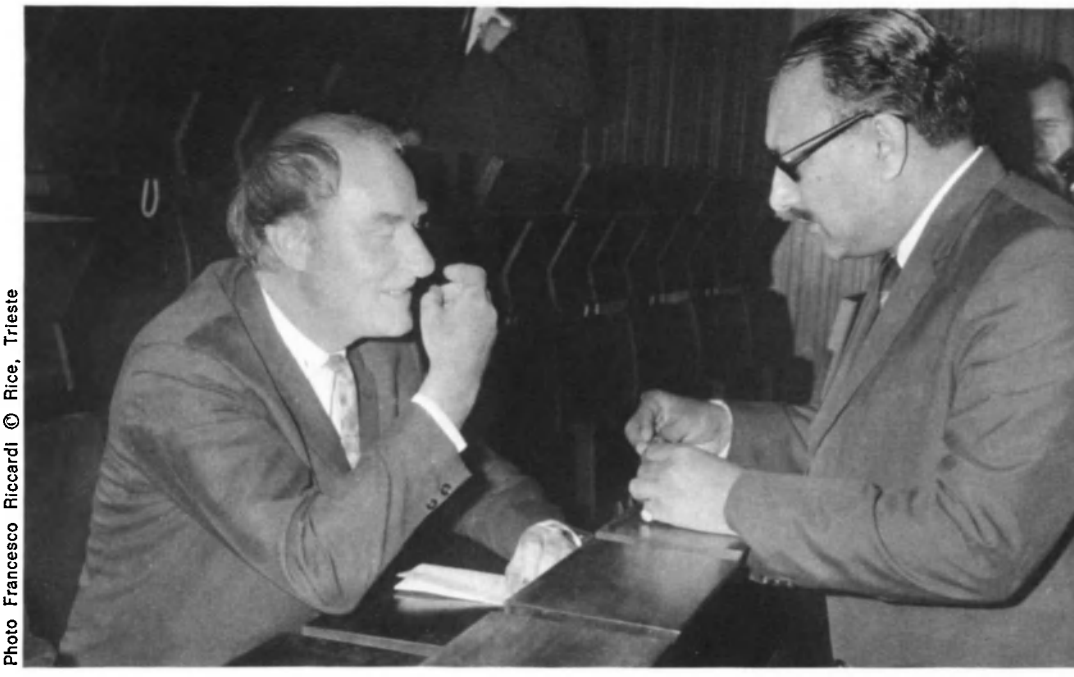

Photo Francesco Riccardi © Rice, Trieste

Many Nobel Prizewinners lecture and attend meetings at the Trieste Centre. No less than eight came to the International Symposium on Contemporary Physics in 1968. Among them was Sir Francis Crick, co-discoverer with James Watson of the molecular structure of DNA, the "messenger" that carries nature's genetic code. Sir Francis Is seen here (seated) talking to Prof. Abdus Salam, Director of the Centre.

symposium in Trieste on elementary particle interactions.

Prof. Budini was also seeking a way out of isolation, in this case the geographic predicament of Trieste in a cul-de-sac at the far corner of Italy. Nationalism did not make much sense to this physics professor at the University of Trieste whose birthplace, an island that once belonged to Venice, has changed flags three times in his own lifetime. He dreamt of a Trieste lying instead in the centre of Europe, a pole of attraction to fellow physicists from the world over. He and Prof. Salam had no trouble putting their dreams together.

Money was put up by a local bank, the Cassa di Risparmio di Trieste. An offer of land, later converted to money, came from Prince Raimondo di Torre e Tasso whose nearby castle at Duino has played host to Liszt, Mark Twain, Rilke and, most recently, to the 1970 Pugwash Conference. The prince said: "Trieste is my daughter and this is my dowry."

In 1962, the General Conference of the International Atomic Energy Agency approved the creation of a centre. "That was the most momentous day of my life," Prof. Salam told me. "I seldom smoke, but I must have smoked fifty cigarettes that day and I went through a kilo of grapes. At the end of the debate, sixty hands went up in favour—and we had won."

The following year, the Italian government's offer of Trieste as a site was accepted and, in 1964, Prof. Salam and his staff moved into temporary quarters in the heart of the city. Four years later, they were in their present building at Miramare, a long double-decker sandwich in concrete with two rows of wood-framed windows as the filling.

On the grounds of the building, there is a small house where Prof. Salam lives while he is at the centre. It is only twenty yards or so from his office window but he can spend two weeks at a stretch seeing nothing more of the outside world than those twenty yards. He has one group working in Trieste, another at Imperial College in London. In the centre, he and his collaborator, John Strathdee, share an office decorated principally with blackboards and equations.

Prof. Salam told me they were endeavouring to put under one unified scheme the micro and the macro universes inside the nucleus and outside in galactic space to cover the frontiers between the behaviour of elementary particles measuring 10^{-15} centimetres (that is, the number one preceded by fifteen zeroes and a decimal point) and the so-called quasars that lie 10^{27} centimetres (the number one followed by twenty-seven zeroes) away from the earth. Prof. Salam is fascinated by the "black holes of gravity" in space occupied by celestial bodies that have collapsed under the weak but relentless force of gravity.

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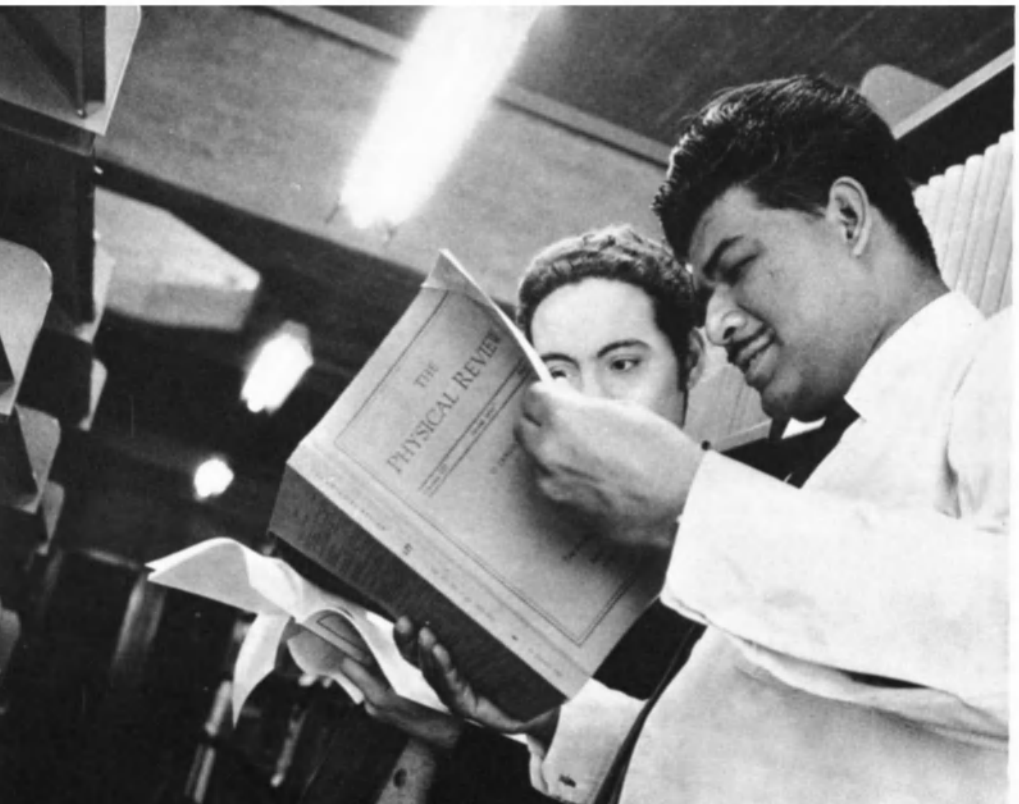
Photos Dominique Roger - Unesco



The loneliness of the long-distance scientist

Theoretical physicists, such as those found at Trieste, try to explain the behaviour of elementary particles. But though he may use a computer, the physicist's main tool is his mind, and he must have contact with other minds if he is to keep it honed.

This problem, a major one for many scientists from the developing world, was explained to me by Dr. Paul Vitta who got his Ph. D. in the United States and is now teaching at the physics department of the university of Dar-es-Salaam, in Tanzania.

He had come to the centre to attend a two-month nuclear theory course that was just ending. "In Tanzania," he said, "I am the only nuclear physicist. I am in perfect isolation. With our teaching load, one very soon gives up all hope of research. So you pick up a textbook. It gets out of date, but you're stuck with it. I simply need to come to a centre like this."

DR. Khaik Leang Lim, from the University of Malaysia at Kuala Lumpur, is the only Malaysian theoretical nuclear physicist. "There might be some outside, but not in the country. If you're on your own, you can only read scientific journals. It's hard to keep up. Your interest fluctuates when you get tired reading. And there is no one to talk to."

Dr. Lim is an associate at the centre which means that he has the right to three three-month stays there over a period of five years. Trieste now has sixty such associates from more than twenty countries. It hopes to expand the list until it covers all the estimated 200 theoretical nuclear physicists in the developing world. The centre's activities are now being extended into mathematics as well.

He thinks that basic science is necessary to a developing country if only because over-specialized scientists have trouble adapting to change, but he certainly does not believe that Malaysia needs the whole gamut of theoretical physics. His own speciality, nuclear physics, requires fast computers that are not available at home. "Here, I must think of something to do that requires less computation. One cannot change from one field to another, but one can change within a field. In that respect, the centre helps the individual. He can meet people in the same or related fields, he can learn what's going on"

Dr. Lim would like to see a similar centre some day in Southeast Asia, perhaps in Bangkok. He had to come all the way to Trieste to meet Dr. I.T. Cheon from Korea with whom he is now collaborating by correspondence.

It was once fashionable to remark that no Einstein can come out of the jungle, but the reply heard at Trieste to that is simply: "Why not?" A physicist can come from almost anywhere. Paul Vitta grew up on a farm in a village 600 miles from Dar-es-Salaam, the capital of his native Tanzania, where he went to boarding school. For the educational revolution is paying off.

Omar El Amin, a research worker at the University of Khartoum's radiation and isotope centre in the Sudan, is one of five brothers whose father was a crewman on a Nile river steamer. He reminded me that education in the Sudan is free. It enabled him to reach the point where he was able to go to the University of London for his M. Sc. in radiation physics. Of his brothers, one is a textile technician, another is also studying science, one is in the army and the fourth is working in electronics engineering at Kiev. Mr. El Amin, an experimental physicist, wanted to come to the Trieste centre to "see what theoreticians do with their long equations and their mathematics."

Scientists often say that the best way to look at a phenomenon is to study an extreme case. In that respect, Dr. Toshar Gujadhur certainly qualifies as the most isolated of the theoretical physicists in Trieste. His home is on the island of Mauritius and he was returning there after an absence of ten years that began when he went to Imperial College to earn his doctorate in mathematical physics.

He was about to take a post in a new teacher training institute on Mauritius. "I want to go back, my roots are there, but it will mean complete paralysis of the mind if I cannot get to Trieste every three years or so. I'm working in relativity and quantum mechanics. Learning to me is like food, I need it. It's a challenge; you do it in spurts. I'm here at least twelve hours a day, six days a week. I arrive around eight or nine in the morning, sometimes I go home on the last bus at 10:30 at night. Some people prefer to work only at night so the place is open twenty-four hours a day."

To Dr. Gujadhur, the greatest advantage of the Trieste centre is its mere existence. "It is a meeting-ground, it offers post-doctoral training but, most of all, there is the fact that one can come back. I must be able to tell myself that I will always be able to come here for three months. Otherwise, one is just cut off."

That is a precarious situation for the physicist. Prof. Georges Ripka of the French Atomic Energy Commission at Saclay, who co-organized the nuclear theory course with. Prof. Luciano Fonda of the University of Trieste, believes that the scientist in a developing country runs the risk of doing "perfectly good but irrelevant work." If he only reads scientific journals, he cannot keep up and there is the danger that he will do work already performed elsewhere. "In an hour's conversation with a physicist." said Prof. Ripka, "I learn more than in a day in the library."

The theoretician must also remain in touch with the experimentalist, as is the case at Trieste. "Research is not walking in a garden and waiting for a good idea," said Prof. Ripka. "Physics, unlike mathematics, is an approximate science. One must construct corrected theories when new experimental data come in. It's not that the old theories and experiments are bad, they are approximate. In physics, one is always guessing. Our guessing is never quite wrong, and never absolutely right."

A number of guest lecturers participated in the nuclear theory course as they do in all the training given at Trieste. The centre has become a sort of crossroads for physicists in Europe and it is not unusual for a man to come down from Germany or up from Yugoslavia to lecture for a day or two. The centre pays for his stay and his own institution pays his salary as a contribution by the scientific community to Trieste.

Participants in the course worked hard with three lectures a day followed by a seminar in which each one talked about what he was doing. Most of the lectures were in the forefront of the subject because, as Prof. Ripka remarked to me, it just as easy to teach new material as it is to teach the old, Prof. Ripka was particularly pleased that many participants had

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Photo Museum of Bosnia-Hercegovina, Sarajevo

Hewn from a solid block of stone, this tomb is a typical example of 14th and 15th century Bogomil funerary art. It is made in the form of a house of the period. Some thirty thousand of these tombs or "Stetchaks" are still to be seen in present day Yugoslavia, decorated with engravings which are both realistic and symbolic. The stags on the side of this tomb stood for justice and purity in the religious art of the Bogomils (a heretical Christian sect which first appeared in the Balkans in the 10th century). Front of tomb bears stylized cross and vine motif —Christian symbol of knowledge.

THE FUNERARY ART OF THE BOGOMILS

THE STONES WITH THE RAISED HANDS

by Miroslav Krleza

SCATTERED throughout Yugoslavia, from the Adriatic to the rivers Una and Morava, are some 30,000 ancient tombstones or "stetchaks" (from the Croato-Serbian word "stécak", meaning "standing stone"). Massive monolithic blocks weathered by the centuries and weighing anything from two to thirty-two tons, they are also known as Bogomil "marbles", or simply "Bogomils", from the name of an ancient religious cult which found refuge in the Balkans in medieval times.

Twelve of the numerous tombstones of this type found in Bosnia-Hercegovina figured in a recent exhibition on "Yugoslav Art from Prehistory to Today", held in Paris. It was the first time that such tombstones had left Yugoslavia for an exhibition abroad.

What is known about these tombstones with their wealth of carved

CONTINUED PAGE 20

MIROSLAV KRLEZA *is Director of the Yugoslav Encyclopaedia. Author, poet, playwright and essayist, he is a leading figure of Yugoslav letters. He has organized several international exhibitions of Yugoslav medieval art and has written a number of books on the southern Slav civilization.*

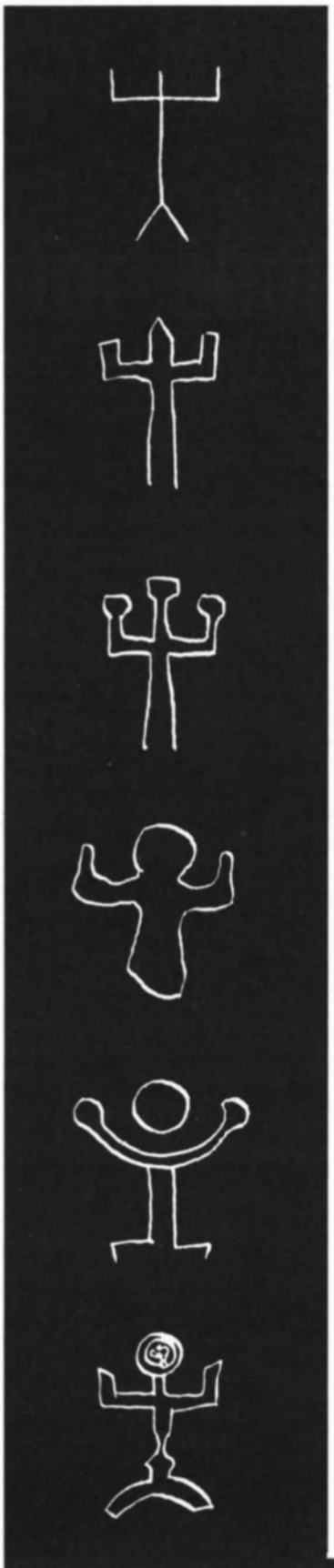
Hands in revolt

Engravings and sculpture carved on the Bogomil tombs of Bosnia and Hercegovina proclaim the faith that inspired this medieval heretical sect in its struggle against a merciless repression by the Inquisition. Many of the Bogomil stone communities of the dead (like the one in Hercegovina, below) have survived, with carvings that record ancient rites and symbols whose meanings are often difficult to decipher. On the upper half of the tombstone, right, figures dance the "kolo" —a folk dance still popular in the Balkans— but here the linked hands of the dancers clasp a cross. The lower frieze depicts a line of stags (see photo page 17). Below right, a cross symbolically entwined with vines decorates the end of this tomb (see also page 17). On the side, the sculptor has carved the effigy of the dead person, with hands upraised, and flanked by two mourners. Far right, a tomb bearing the most recurrent feature of Bogomil tomb decoration: a figure with raised hands. This may be a symbol of revolt, a challenge, an allusion to the Crucifixion, or even a combination of all three. The human figure is surmounted by a crescent moon, a pagan symbol, and by floral designs that are still embroidered on traditional local costumes today.

Photos Museum of Bosnia-Hercegovina, Sarajevo

Photo © Parimage, Paris

30,000 sculptured monoliths



designs, often grouped in vast cemeteries, in remote forest or mountain areas, and about those who raised and decorated them?

One of the first writers to describe the monoliths in these ancient graveyards in some detail was an early 19th century traveller, Prince Alexander Sapieha, who sought to understand the meaning of the carved figurative reliefs and symbolical designs that decorate these standing stones.

In 1802-1803 he travelled through the republic of Dubrovnik and in the diary of his journey, published in Warsaw in 1811, he noted the strange characteristic shape of the stones that recalled, as he put it, "the roof of a funeral vault." Prince Sapieha suggested that the carved decorations were meant to symbolize the eternity of life triumphant over the destructive power of death.

But until comparatively recent times, no one had systematically studied the gravestones or the artistic value of their carvings. Dating from the middle ages, and certainly from before the Turkish invasion in the 15th century, they are all hewn from single blocks, often so roughly that their simplicity gives an impression of force.

About one-third of the gravestones are richly decorated in relief with figurative compositions whose meaning often remains obscure. A recurrent motif, for instance, is the upraised human hand, but whether it symbolizes a command or a threat, a greeting or a challenge, is still not known.

As a feature of burial decoration, carvings of the human hand are known to date back to the prehistoric cave dwellings of the Dordogne in France. The hands depicted on medieval tombstones, peacefully joined in prayer, have survived from Gothic art to the present day; they are a familiar sign by which we recognize the human form, a detail which is often more important than any other feature of a human effigy.

But the knightly, gauntleted hands of the Bosnian barons and boyars who take leave of us to cross the Acheron, the Greek river of the Underworld, and who seem to hail us from the opposite bank, appear to have an entirely different meaning. These Bogomil monuments have few recumbent figures with their hands folded in prayer at the approach of death.

By contrast with traditional effigies of the dead, the massive, disproportionately large hands on the "stetchaks", solemnly and firmly upraised, seem to proclaim across the centuries that these were hands of iron, hands in revolt, symbols of a sturdy breed of men who refused to submit to the will of the Inquisition as it waged its combat against the heretics of Bosnia.

Sculpted on armour, on shields, bearing swords and lances, these hands recall the symbolism with which the Middle Ages invested the gauntlet —the sign of a challenge to a duel. In this case it was a challenge to ecclesiastical authority, a defiance far more radical than that of John Wycliffe, Jan Huss or Martin Luther, centuries later.

THE first printed reference to the Bogomil cemeteries is found in the *Itinerarium*, published in 1531, the earliest known account of travels in the Balkans. Its author, Benedikt Kuripesic, a Slovene, acted as interpreter for a diplomatic mission sent to Constantinople by the Holy Roman Emperor Ferdinand I, ruler of Austria, to conclude a peace treaty between Austria and Turkey.

Instead of taking the customary "imperial route" via Belgrade and Sofia, the travellers went through Croatia and Bosnia. Kuripesic noticed

these mysterious monuments, and copied some of their epitaphs; but unfamiliar with the Cyrillic alphabet, or else misled by local interpreters, he published them in a very free rendering. A year later a second Austrian diplomatic mission, following the same route, also noted the curious monuments to be seen "in the valleys and on the mountains of Bosnia."

But it was not until two centuries later that travellers halted before these stones and tried to fathom their secret. A Dalmatian Franciscan friar, Gaspard Vinjalic, in a book published in Venice, referred to the Bogomil stone "funeral vaults"; and at almost the same time, in 1775 a Venetian, Father Alberto Fortis, published his famous "Dalmatian Journey". One of the most remarkable passages in this account describes the graveyard located near the source of the Cetina, near the Church of the Holy Saviour.

When Dalmatia became a colony of Venice great interest was aroused by this largely unknown and apparently "wild" country. Many years after its publication, Father Fortis' book provided Prosper Mérimée with a major source of inspiration for his famous literary hoax "La Guzla", which was supposed to be a collection of Dalmatian poetry. All western Europe was taken in by this picturesque and highly romanticized work, which presented an oversimplified picture of the Morlachs as a chivalrous people who lived on the frontiers of Venice, Turkey and Austria, who believed in vampires, fought endless battles, carried on bloody feuds against their enemies and chanted Homeric poems ...

Great figures such as Byron, Gœthe, Pushkin and Mickiewicz gave credence to these flights of poetic fancy. Thus Mérimée's work created the legend of a barely civilized people, primitive, poor and backward, whose silver-decorated weapons, splendid national costumes, blind bards and local

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A number of stylized motifs, taken from 14th and 15th century Bogomil sculptures, frame page 20 opposite. The vertical column shows the similarity in designs used to represent the cross and a man with upraised arms. In the horizontal strip the cross becomes convoluted and mingled with the tendrils of the vine. Above, on the front of the tomb an elaborately worked floral frieze, repeated on the base, sets off a carving of a man and a woman holding hands. Right, another funerary carving representing a figure carrying a cross beside a vine.

Photos Museum of Bosnia-Hercegovina, Sarajevo

customs seemed to make them as strikingly picturesque as the wax figures in an ethnographical museum.

Unfortunately, while the works of Mérimée and Fortis are well-known, the other side of the picture, presented by a doctor of medicine from Padua, Giovanni Lovrich, is not. Lovrich, who died young, published in 1777 his "Comments on the Dalmatian Journey by Alberto Fortis," in which he accused Fortis of completely misinterpreting even the most elementary facts.

It is Lovrich who should be given credit for being one of the first to throw light on the problem of the relationship between the Morlachs and the Haiduks, political outlaws and guerilla champions of freedom, who for centuries waged warfare against the Turks as the spearhead of resistance by the southern Slavonic peoples. And it was Lovrich who drew the attention of the western world to the rich historical and artistic past of these peoples.

For six centuries the southern Slavs were unceasingly harried and "hunted like wolves" by the Turks. They nevertheless raised historical and cultural monuments and created literary traditions, particularly the Adriatic Slavs, who from the 16th and 17th centuries onwards produced many works of lyric and epic poetry, drama, history, politics and science.

Here, in fact, was a vigorous civilization that had been engulfed by wars, though this was naturally not so evident to an 18th century observer as it is to us today. We now know that this is the graveyard of an art and culture which, between the 9th and 16th centuries, bequeathed to us, over and above the Bogomil cemeteries, innumerable frescoes, countless palaces, castles, villas, fortresses, churches, monasteries, towns, and other monuments, embellished with a wealth of artistic decoration.

This unbroken vein of creativeness in architecture, sculpture and painting, extended from the Lombardo-Ravennine and Carolingian period, through the neo-Hellenic and Byzantine frescoes of the 12th to the 14th centuries, up to the Ragusan, Dalmatian and Slovene painters, sculptors and architects of the humanist period and the Renaissance.

It is within the thousand-year span of this tradition, but particularly in the period between the 11th century and the Turkish conquest of Bosnia in 1463, that the graveyards of "stetchaks" were raised in Bosnia-Hercegovina, which had become a refuge for heretics from every point of the compass.

Bosnia was for centuries a Patarene, Cathar, Manichaean and Bogomil country, but it was mainly to Bogomilism, a purely Balkan heresy which grew up in Bulgaria in the tenth century and which was violently repressed in the twelfth century throughout the Balkans, that the mountainous and freedom-loving country of Bosnia offered an ideal place of refuge.

The nature of this heresy is reflected in the "stetchaks", which exalt with defiant paganism the earthly pleasures, dancing, the joys of the chase, and which depict animals and plants

PRINCE Sapieha, in the diary of his travels already referred to, guessed at the secret inspiration of these great white monoliths from their decoration: birds resembling the divine Ibis, visions of fabulous animals, rivers flowing beneath the stars, knights in arms, gazelles in flight, bears, hounds and wolves seen against a backdrop of endless forests.

He described the graveyards of Stolac and Radimlje, and noted the problem they presented for the archaeologist. He explained the heraldic significance of certain details; and he compared their unusual forms with artistic motifs from the north, on the shores of the Baltic, also drawing a comparison with certain decorations on Egyptian and Parthian tombs.

Other scholars studied the mystery of the "stetchaks", among them a Yugoslav, Katalinic, a Frenchman, Ami Boué (1794-1881) and an Italian, Francesco Cusani. It was, however, a famous Egyptologist, Sir John Gardener Wilkinson, who first dated the tombstones as preceding the Turkish invasion, and who has given us the most complete account of these cemeteries.

In 1884, starting at the source of the Cetina river and continuing into Hercegovina, Wilkinson described in detail the shape and sculptural decoration of the "stetchaks". Significantly, he noted that their themes were still closely linked with local folk tales and stories of marriages, the deaths of heroes, of conflicts between suitors.

From Wilkinson onwards up to contemporary writers, comparative studies have enriched the body of writing on the "stetchaks". According to one convincing thesis, the gravestones reproduce features of a very ancient type of wood-engraving brought by the Slavs when they settled in the Balkans. The stylistic motifs of this art form a whole, and are linked with both the sculpture of the Baltic and the Caucasus, and traditional Scythian and Sarmatian art. ■

Photo © Laurence Brun, Paris

The culture of machine living

by Max Lerner

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ONE could draw a gloomy picture of machine living in America and depict it as the Moloch swallowing the youth and resilience of American manhood. From Butler's *Erewhon* to Capek's *R.U.R.*, European thinkers have seized on the machine as the cancer of modern living. Some have even suggested that there is a daimon in Western man, and especially in the American, that is driving him to the monstrous destruction of his instinctual life and indeed of his whole civilization.

Part of the confusion flows from the failure to distinguish at least three phases of the machine culture. One is *machine living* as such, the use of machinery in work and in leisure and in the constant accompaniments of the day. The second is cultural *standardization*, aside from the machine, but a standardization that flows from machine production. The third is *conformism* in thought, attitude, and action. All three are parts of the empire of the machine but at varying removes and with different degrees of danger for the human spirit.

The danger in machine living itself is chiefly the danger of man's arrogance in exulting over the seemingly easy triumphs over Nature which he calls

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MAX LERNER, *American author and columnist, is Professor of American Civilization at Brandeis University and was formerly a member of the Social Sciences Faculties of Sarah Lawrence College, Harvard University and Williams College in the United States. Widely known as an editor, lecturer and radio commentator, he was formerly Managing Editor of the "Encyclopaedia of the Social Sciences." His books include: "Ideas and Weapons" (1939), "Ideas for the Ice Age" (1941), "The Unfinished Country" (1959), "Education and a Radical Humanism" (1962). This article is taken with the author's permission from his book "America as a Civilization" (paperback: Clarion book published by Simon and Schuster, two volumes, New York, 1967).*

Photo © Niepce-Rapho, Paris

The veneer of uniformity

"progress," so that he cuts himself off increasingly from the organic processes of life itself.

Thus with the soil: the erosion of the American earth is not, as some seem to believe, the result of the mechanization of agriculture; a farmer can use science and farm technology to the full, and he need not exhaust or destroy his soil but can replenish it, as has been shown in the Tennessee Valley Authority (1), which is itself a triumph of technology.

But the machines have been accompanied by a greed for quick results and an irreverence for the soil which are responsible for destroying the balance between man and the environment. What is true of the soil is true of the household: the mechanized household appliances have not destroyed the home or undermined family life; rural electrification has made the farmer's wife less a drudge, and the mass production of suburban houses has given the white-collar family a better chance than it had for sun and living space. What threatens family life is not the "kitchen revolution" or the "housing revolution" but the restless malaise of the spirit, of which the machine is more product than creator.

EVEN in a society remarkable for its self-criticism, the major American writers have not succumbed to the temptation of making the machine into a Devil. Most of the novelists have amply expressed the frustrations of American life, and some (Dreiser, Dos Passos, Farrell and Algren come to mind) have mirrored in their style the pulse beats of an urban mechanized civilization. But except for a few isolated works, like Elmer Rice's *Adding Machine* and Eugene O'Neill's *Dynamo*, the writers have refrained from the pathetic fallacy of ascribing the ills of the spirit to the diabolism of the machine.

The greatest American work on technology and its consequences—Lewis Mumford's massive four-volume work *The Renewal of Life*—makes the crucial distinction between what is due to the machine itself and what is due to the human institutions that guide it and determine its uses.

It is here, moving from machine living to cultural standardization, that the picture becomes bleaker. Henry Miller's phrase for its American form is "the air-conditioned nightmare." Someone with a satiric intent could do a withering take-off on the rituals of American standardization.

Most American babies (he might say) are born in standardized hospitals, with a standardized tag put around them to keep them from getting confused with other standardized products of the hospital. Many of them grow up either in uniform rows of tenements or of small-town or suburban houses. They are wheeled about in standard perambulators, shiny or shabby as may be, fed from standardized bottles with standardized nipples according to standardized formulas, and tied up with standardized diapers.

In childhood they are fed standardized breakfast foods out of standardized boxes with pictures of standardized heroes on them. They are sent to monotonously similar schoolhouses, where almost uniformly stand-

(1) A U.S. federal corporation created in 1933 to conserve and develop the resources of the Tennessee River Valley.

Photo © Rocketdyne, U.S.A.

Uniformly dressed babies (far left) and a moon-flight rocket motor, suggestive of a giant robot "nurse", seem like images out of Aldous Huxley's satirical novel "Brave New World", written in 1932. But Huxley's ominous vision of a society that disregards individual dignity, worships the machine and "manufactures" standardized laboratory babies has happily not materialized. The machine makes uniformity of life possible, says Max Lerner, but it does not compel such uniformity. The economics of mass production has put a premium on uniformity, but for the person who has a personality style of his own, standardization need not mean anything more than a set of conveniences which leave a larger margin of leisure and greater scope for creative living.

ardized teachers ladle out to them standardized information out of standardized textbooks. They pick up the routine wisdom of the streets in standard slang and learn the routine terms which constrict the range of their language within dishearteningly narrow limits.

They wear out standardized shoes playing standardized games, or as passive observers they follow through standardized newspaper accounts or standardized radio and TV programmes the highly ritualized antics of grown-up professionals playing the same games. They devour in millions of uniform pulp comic books the prowess of standardized supermen.

As they grow older they dance to canned music from canned juke boxes, millions of them putting standard coins into standard slots to get standardized tunes sung by voices with standardized inflections of emotion. They date with standardized girls in standardized cars. They see automatons thrown on millions of the same movie and TV screens, watching stereotyped love scenes adapted from made-to-order stories in standardized magazines.

They spend the days of their years with monotonous regularity in factory, office, and shop, performing routinized operations at regular intervals. They take time out for standardized "coffee breaks" and later a quick standardized lunch, come home at night to eat processed or canned food, and read syndicated columns and comic strips.

Dressed in standardized clothes they attend standardized club meetings, church services, and socials. They have standardized fun at standardized big city conventions. They are drafted into standardized armies, and if they escape the death of mechanized warfare they die of highly uniform diseases, and to the accompaniment of routine platitudes they are buried in standardized graves and celebrated by standardized obituary notices.

Caricature? Yes, perhaps a crude one, but with a core of frightening validity in it. Every society has its routines and rituals, the primitive groups being sometimes more tyrannously restricted by convention than the industrial societies. The difference is that where the primitive is bound by the rituals of tradition and group life, the American is bound by the rituals of the machine, its products, and their distribution and consumption.

The role of the machine in this standardized living must be made clear. The machine mechanizes life, and since mass production is part of Big Technology, the machine also makes uniformity of life possible. But it does not compel such uniformity.

The American who shaves with an electric razor and his wife who buys a standardized "home permanent" for her hair do not thereby have to wear a uniformly vacuous expression through the day. A newspaper that uses the press association wire stories and prints from a highly mechanized set of presses does not thereby have to take the same view of the world that every other paper takes. A novelist who uses a typewriter instead of a quill pen does not have to turn out machine-made historical romances.

The answer is that some do and some don't. What the machine and the mass-produced commodities have done has been to make conformism easier. To buy and use what everyone

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else does, and live and think as everyone else does, becomes a short cut involving no need for one's own thinking. Those Americans have been captured by conformist living who have been capturable by it.

Cultural stereotypes are an inherent part of all group living, and they become sharper with mass living. There have always been unthinking people leading formless, atomized lives. What has happened in America is that the economics of mass production has put a premium on uniformity, so that America produces more units of more commodities (although sometimes of fewer models) than other cultures. American salesmanship has sought out every potential buyer of a product, so that standardization makes its way by the force of the distributive mechanism into every life.

Above, headlights of innumerable cars create brilliant patterns resembling a collection of diamond bracelets, as they cross overpass bridges on four levels, in Los Angeles, California. Right, twin loudspeakers look like bicycle racers in a drive-in cinema where motorists can park to watch a film show from their cars.

YET for the person who has a personality pattern and style of his own, standardization need not mean anything more than a set of conveniences which leave a larger margin of leisure and greater scope for creative living. "That we may be enamored by the negation brought by the machine," as Frank Lloyd Wright has put it, "may be inevitable for a time. But I like to imagine this novel negation to be only a platform underfoot to enable a greater splendour of life to be ours than any known to Greek or Roman, Goth or Moor. We should know a life beside which the life they knew would seem not only limited in scale and narrow in range but pale in richness of the colour of imagination and integrity of spirit."

Which is to say that technology is the shell of American life, but a shell that need not hamper or stultify the modes of living and thinking. The real dangers of the American mode of life are not in the machine or even in standardization as much as they are in conformism.

The dangers do not flow from the contrivances that men have fashioned to lighten their burdens, or from the material abundance which, if anything, should make a richer cultural life possible. They flow rather from the mimesis of the dominant and successful by the weak and mediocre, from the intolerance of diversity, and from the fear of being thought different from one's fellows. This is the essence of conformism.

It would be hard to make the connexion between technology and conformism, unless one argues that men fashion their minds in the image of their surroundings, and that in a society of automatism, human beings themselves will become automatons. But this is simply not so. What relation there is between technology and conformism is far more subtle and less mystical. It is a double relation.

On the one hand, as Jefferson foresaw, the simpler society of small-scale manufacture did not involve concentration of power in a small group, was not vulnerable to breakdown, and did not need drastic governmental controls; a society of big-scale industry has shown that it does. In that sense the big machines carry with them an imperative toward the directed society, which in turn—whether in war or peace—encourages conformism.

On the second score, as De Tocqueville saw, a society in which there is no recognized elite group to serve as the arbiter of morals, thought, and style is bound to be a formless one in which the ordinary person seeks to heal his insecurity by attuning himself to the "tyranny of opinion"—to what others do and say and what they think of him. He is ruled by imitation and prestige rather than a sense of his own worth.

These are dangerous trends, but all of social living is dangerous. The notable fact is that in spite of its machines and standardization America has proved on balance less conformist than some other civilizations where the new technology has played less of a role.

Americans have, it is true, an idolatry of production and consumption as they have an idolatry of success. But they have not idolized authority or submitted unquestioningly to human or supernatural oracles. They have had their cranks, eccentrics, and anarchists, and they still cling to individualism, even when it is being battered hard.

It will take them some time before they can become "man in equipoise", balancing what science and the mach-

Photo USIS

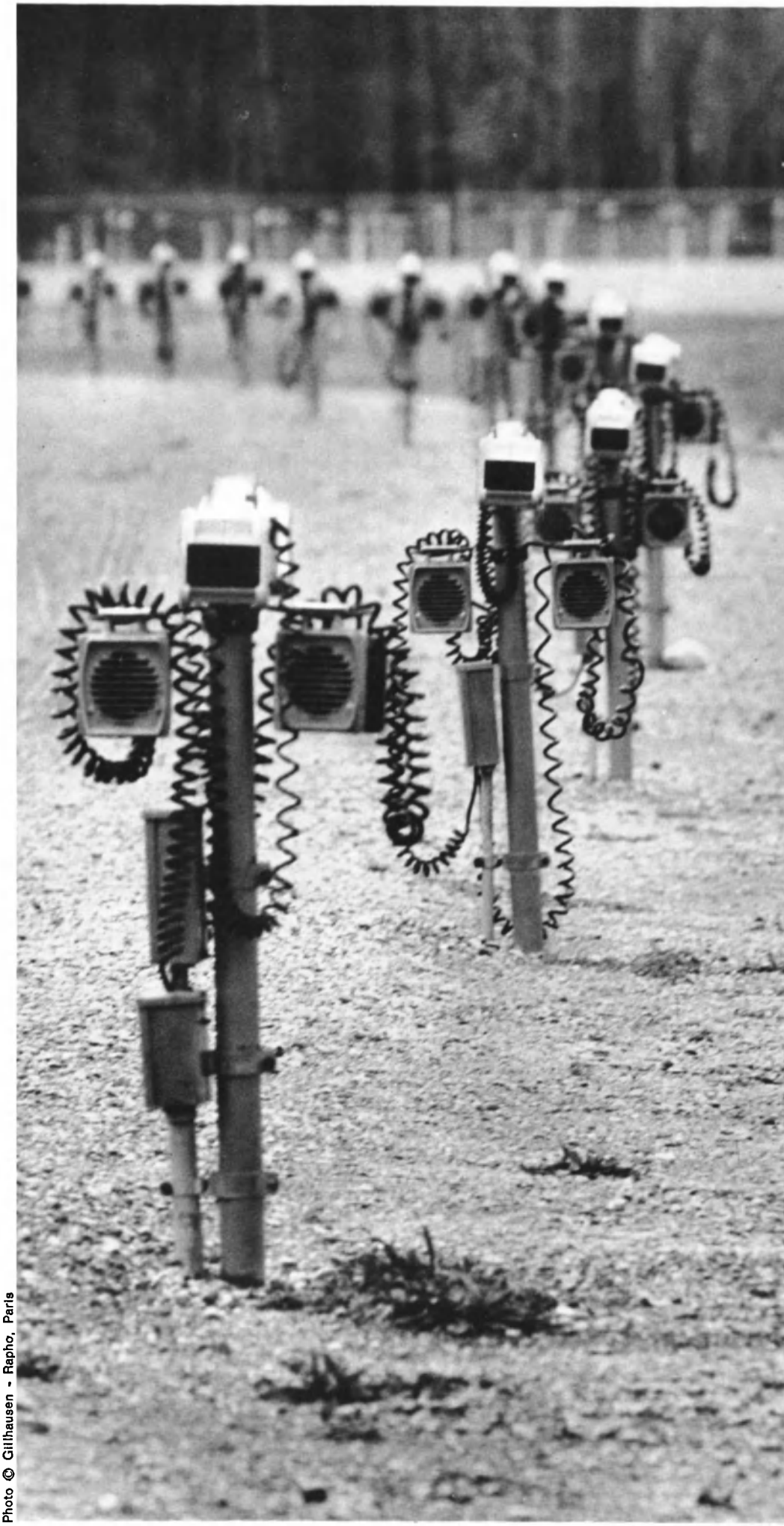

Photo © Gilthausen - Rapho, Paris

ine can do as against the demands of the life processes. But where they have failed, the failure has been less that of the machines they have wrought than of the very human fears, greeds, and competitive drives that have accompanied the building of a powerful culture.

It has been suggested that the American, like the Faustian, made a bargain with the Big Technology: a bargain to transform his ways of life and thought in the image of the machine, in return for the range of power and riches the machine would bring within his reach. It is a fine allegory.

But truer than the Faustian bargain, with its connotations of the sale of one's soul to the Devil, is the image of Prometheus stealing fire from the gods in order to light a path of progress for men. The path is not yet clear, nor the meaning of progress, nor where it is leading: but the bold intent, the irreverence, and the secular daring have all become part of the American experience. ■

Making learning real fun for blind children

by Elizabeth Freund

A blind child clearly cannot explore the world around him as freely as one who is sighted. No matter how hard he tries to "see" with his fingers the objects near to him, many things will escape him completely, either because the objects are too big, like most buildings, or too small, like anything that can be seen only through a microscope. Drawings or photos of far-away things are of no use to him.

An education strictly confined to book learning or oral explanations cannot make up for this great disadvantage, and very often only produces mental pictures which do not conform with reality.

At Overbrook School for the Blind in Philadelphia, U.S.A., we have tried to counteract these difficulties by setting up a "Touch and Learn Center". The idea is not new. Most schools for the blind have some mounted animals, models, feelable maps, etc., but very likely none of their collections is as large and diversified as ours with its 1,800 items. It is not a museum in the traditional sense, but a very active means of instruction in constant use.

There is a world of difference, for instance, between knowing only from hearsay how a water pump is worked and actually operating it oneself. Children are always astonished to find how small a sparrow is— "Such a little thing; I thought it was much bigger". And the cured foot of an elephant makes them aware how enormous the real animal is compared with the small models they had handled previously.

Already, one can almost hear some readers saying: "No wonder, it is easy for these Americans with all their money to have such a collection." As a matter of fact, our collection did not cost very much. The largest expense was for a rubber model of the human body which can be taken apart, and which we had to buy from a school supply house.

Most of the other models were made by ourselves or at sighted schools and later donated to us. A great number of exhibits are gifts from manufacturers, museums, or collectors whom we asked for help.

It would take too long to enumerate each and every item in our collection. We have a good many objects from the Far East, South America, and Africa. There is almost a whole zoo of mounted animals, from a small shrew to an exhibit about whales and whale oil. Fortunately, we often have the same animals in different positions. As a supplement, each spring two truckloads of living farm animals come for a day-long visit— a big improvement on the additional visits to the zoo, when there is not enough time to really get acquainted with the animals.

There are innumerable models of buildings, bridges, and ships. We have a model of a coal mine on which the elevator goes down to the coal layer and comes up with a filled lorry. Most of the buildings have detachable roofs; machinery can be handled and, where possible, there are "cut-away windows" so that the student can feel how the parts move inside.

Whenever necessary, the life size of a small model is indicated by human figures on the same scale; or the right key is given by comparing the model to some well known dimension, such as the size of a football field, the length of the school building, or the height of the classroom.

A water-tank is used in the demonstration of a canal-lock, which really closes and opens so that a little ship can climb from the lower to the higher level. With the help of an electric pump a water-mill turns a cogwheel and makes some bells ring. Any model which has movable parts, or can make a sound, is better than a rigid or silent one.

The children get the greatest benefits from exhibits "in action". For instance, when we lecture about inclined planes, we let the children go up a large inclined board. If they complain that the board is too steep, we can change it into a gangplank by adding rungs. They can roll up kegs or little wagons, and so discover by themselves the advantages of the inclined plane compared to lifting a heavy weight straight upward.

Exhibits of Egyptian, Greek, and Roman temples and buildings, or medieval castles with drawbridges and moats and a full size knight in armour are the best illustrations for these periods. For modern times, we need not only a large collection of aeroplane models, but others of the solar system, rockets, the moon, and Snoopy, the moon landing module.

THE most revolutionary new invention for the instruction of the blind is the electric Thermoform machine made in California. It uses a vacuum forming process under great heat. You write a page in braille on ordinary braille paper, cover this "master" with a plastic sheet, and push it into the heated oven of the machine. A duplicate is produced in a few seconds and this process can be repeated as many times as you want. Mathematical problems, quizzes, or any other kind of information can be duplicated in almost no time at all.

In the very same way "Illustrations" to history, geography, science, or social studies can be produced. A master is made from a paper base from cardboard, netting, sandpaper, tape in different widths, small grains, or metal pieces—in short from anything that will feel different to touch on the finished sheet.

Of course, the resulting picture has only two dimensions; but it is easy to read and by cutting and underlying some parts with an extra layer of card-

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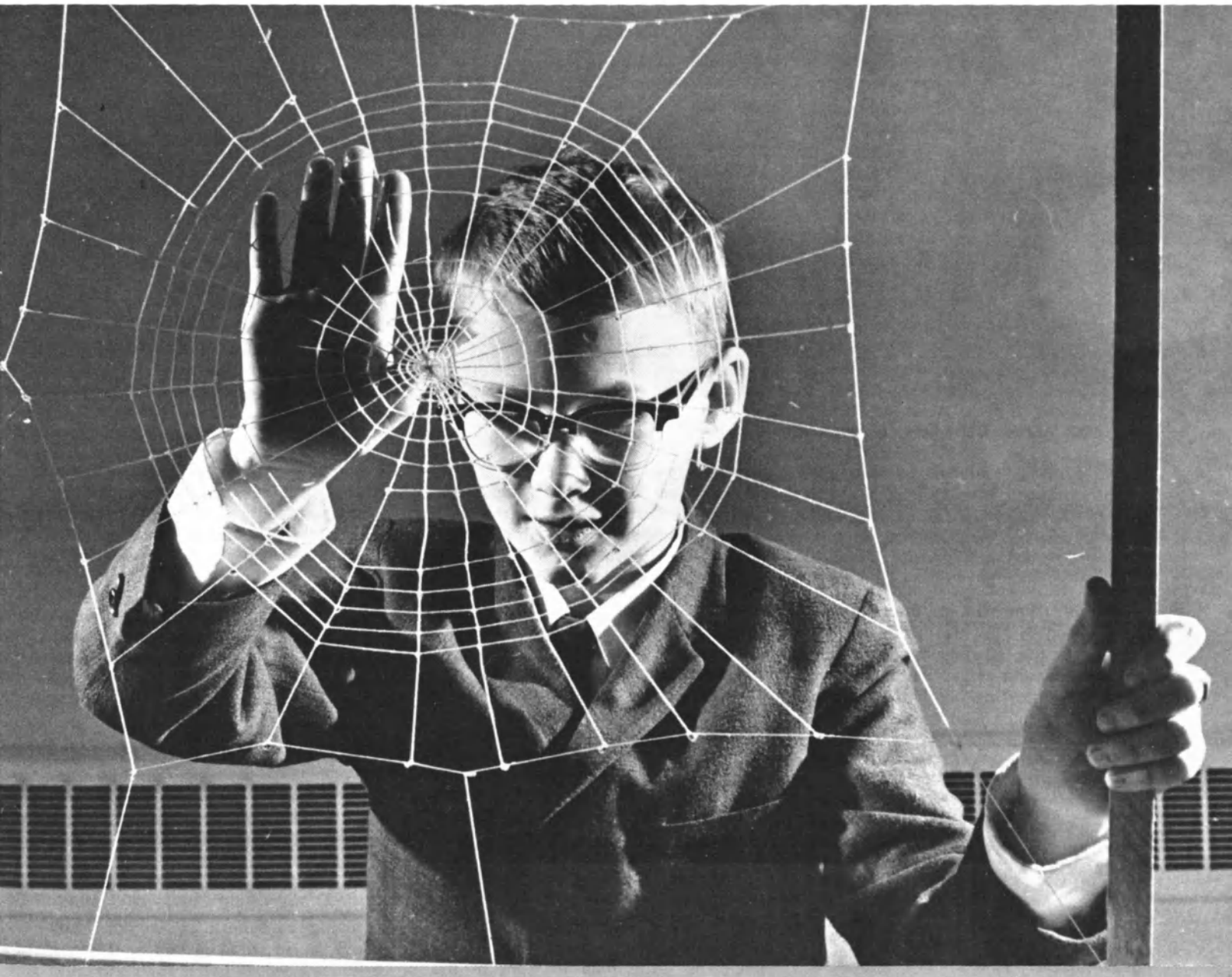
ELIZABETH FREUND *is Curator of the Touch and Learn Center at Overbrook School for the Blind in Philadelphia, U.S.A. She founded the Center in 1959 and has since lectured and written widely on the use of touch and learn techniques in education for the blind. Her manual on teaching longhand writing to blind students is used in schools for the blind in the U.S. and other countries. She is the author of "Crusaders for Light" (1959) which tells the story of the pioneers of education for the blind in the United States.*

Photo © Jules Shick, Philadelphia, U.S.A.



Thanks to special teaching techniques and equipment the horizons of blind persons have widened tremendously in recent years. Overbrook School for the Blind in Philadelphia, U.S.A., for instance, has a Touch and Learn Center where students are able to get a realistic mental picture of objects by handling them. Most of the 1,800 items in the Center's collection—the largest and most diversified of its kind in the U.S.—cost very little to produce. A wooden frame and some fine yarn are all that is required to "spin" this feelable spider's web.

Feelable maps bring geography alive for blind students. The shapes of Europe, left, were cut out of cork sheet and then stuck to a base representing the ocean. Minute gaps between countries mark national borders and different types of upholstery nails stand for capitals and other important cities. On the relief map of Africa, below, plastic strips placed in the gaps between countries make borders easy to identify.

Photos © Jules Schick, Philadelphia

FUN FOR BLIND CHILDREN *(Continued)*

board, a certain 3-dimensional effect can be produced, but any kind of perspective has to be avoided. The students quickly get accustomed to this method, and soon have no difficulty in understanding it.

The only drawback to the Thermoform machine is its price—about $450—plus the current expenses for the plastic sheets. It is a pity that not every school for the blind will be able to afford the purchase of such a machine—its advantages are enormous. On the other hand, the size of a Thermoform picture is only 28 by 28 cm. (11 x 11 in.) so that some things —the larger geographic maps, for example —just cannot be reproduced.

To provide our school with good maps has been one of our major tasks. We had a lot of large, 92 by 123 cm. (3×4 ft.) wooden maps made in jigsaw-puzzle fashion. We improved them by glueing the pieces to their base, and inserting plastic strips into the gaps for borderlines. Another method was to nail the lines between states or countries.

We also made maps from cork sheets 3 mm. (1/8") thick by tracing the outlines of printed maps and glueing the traced paper to the cork upside down (this makes it easier to cut the cork). We cut away 3 mm. at the outside of each part so that when glueing it to the base a gap between states was produced, wide enough to be felt easily.

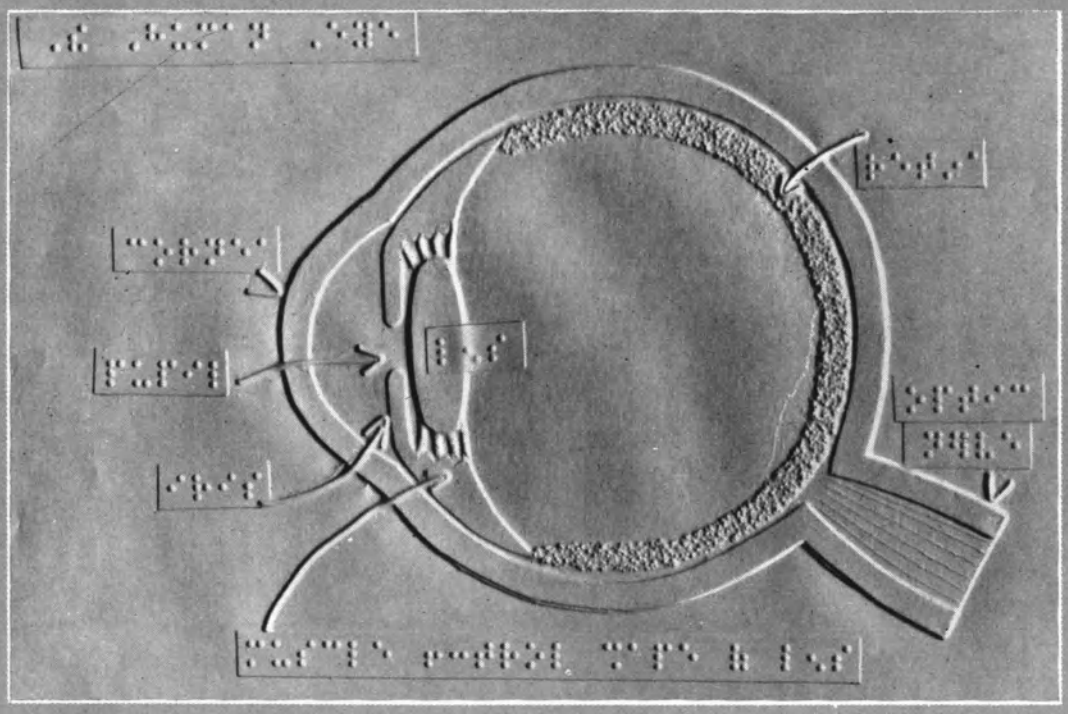
All names were printed on self-adhesive plastic tape in braille and in printed letters. The different states were painted in brilliant colours for the partially blind students. Cork maps are especially suitable for desk-size maps.

IT is important for each student to have a small map before him. The large map in front of the classroom doesn't work too efficiently with blind pupils. These cork maps can be made at negligible costs, and serve their purpose better than brailled paper maps.

When blind students are taught how to find their way around with a cane, it is a great help to have good maps of city or neighbourhood at hand. For our mobility classes, we made not only a map of the school campus and another of its surroundings, but also feelable maps of the subway system, the Philadelphia Suburban Railroad Service, a map showing all the suburbs, and a big map of the centre of the city with markers for all the historical buildings, and the places of interest to a blind person.

These maps seem to fill a real gap in our instruction, as we can see from the enthusiastic reception by our students. For most of the maps we needed a photo enlargement of the section in question from a printed map. Once we had it, it was easy and inexpensive to build whatever we wanted to show, by using cardboard squares for city blocks, balsa wood pieces for bridges or houses, velvet paper for parks, and upholstery nails as markers for railroad stations or important sites.

A very inexpensive help with the instruction of blind children is the screen pad. This is a piece of ordinary metal window-screen stapled to a



A revolutionary new invention for teaching the blind is the electric thermoform machine. A sort of blind man's photocopier, it uses a vacuum process under great heat to reproduce a sheet of braille writing in a few seconds. "Illustrations" made from a variety of materials with a different feel (cardboard, netting, sandpaper, tape, metals, etc.) can be reproduced in the same way. A sheet of plastic is placed over the master copy and pushed into the heated oven of the machine. Photo, above, shows an illustration of the human eye made by the thermoform process. Similar illustrations have been used to teach about plant growth, place setting at table, the development of the human embryo, the human skeleton, etc.

heavy cardboard of approximately 36 by 46 cm. (14×18 in.). If you cover this board with thin newsprint paper and use an oil crayon, the underlying mesh will hold back the oily material of the crayon so that the blind student can feel what he is drawing, while he is drawing. The screen pads can be used in mathematics, geography, etc., by the students themselves; or the teacher can use this tool for making a quick sketch when explaining a topic.

We even found that totally blind children who had been deprived of the joy and pleasure of drawing pictures can do so on these screen pads. Characteristic was a conversation overheard between two totally blind girls of about 12 years of age. One said: "What did you draw?" And the other told her that she had drawn a rabbit. (They had been shown mounted rabbits before this lesson). "Oh, let me see," said the first girl, and "looked" at the picture. She felt it carefully—tail, head, body, and paws—and then said with great admiration. "Isn't that a very nice rabbit!"

The screen pad was instrumental, too, in teaching the students how to sign their names. For this purpose, the thin paper was lined in braille. We wrote a Manual about Longhand-Writing, which is now widely used not only at our school, but at other American schools, too. Since the students get a good mental picture of the shape of a letter by feeling it, the results of this method are good.

The largest Touch and Learn collection would be of no value at all, if it were not used regularly. In our school all the elementary classes come for at least one period weekly, and are shown exhibits relating to their studies.

Teachers may also borrow material, if they want to use it in their classrooms. We arrange exhibits for secondary school classes on request. Co-operation with the teachers is most essential, and once it is established, it really works. The teachers ask for the models they need and the Touch and Learn Center is more than glad to make these models, or try to find the material wanted.

A well-kept filing system is fundamental for the best use of a collection. Our material is classified not only alphabetically, but also by subject, so that if a certain exhibit is requested we are reminded which other items might be used in connexion with this lecture.

We hope that some of the ideas we use in Philadelphia may stimulate other schools to build up a similar collection. As we stressed at the beginning, this project need **not** to be expensive, but some initiative and imagination are necessary. The work is fascinating and the results are most rewarding. In our case we know that it has widened the horizons of our students immensely.

I will be glad to give more details or explanations if needed. Please get in touch with us—German, English, Spanish and French will be understood (1).

In any case, may I wish you a lot of good luck for your Touch and Learn Center. ■

(1) The Overbrook School for the Blind is located at 64th Street and Malvern Avenue, Philadelphia, Pa. 19131, U.S.A.

TRIESTE—WORLD RENDEZVOUS FOR PHYSICISTS *(Continued from page 16)*

arranged to collaborate by post. Such arrangements are valid, he thinks, if they are preceded by personal contacts. "In nuclear theory, contacts are invaluable. That's how I got started myself. I was invited to go from France to a conference in New York and I talked to a lecturer there. He got me going and he put me in touch with a student of his in Belgium. After speaking to him, I had the drive and I'm sure my case is typical. That is why I feel responsibility to a fellow here. He must go home with all that he can."

Such courses are far from the centre's main function. In fact, every time one looks around, another function seems to appear. Besides courses, associateships, research workshops and occasional symposia, the centre has a system of federated institutions. They number twenty from sixteen countries and each has the right to send a scientist of its own choosing to Trieste for a period of up to 40 days a year. Such is the thirst for theoretical physics that some institutions send forty scientists for one day—and they stretch their subsistence allowance to cover nearly a week by staying in modest boarding houses or with friends.

EVEN a week is enough to become imbued with the atmosphere of the International Centre for Theoretical Physics. The long corridor that leads to Prof. Salam's office on the second floor is punctuated by portraits of the centre's spiritual fathers: Einstein, Niels Bohr, Oppenheimer, Werner Heisenberg, Wolfgang Pauli, Louis de Broglie, among others... and a humorous New Year's card from Lev Landau showing the fox who fished with his tail. The developing world flocks to Trieste and to what these names represent. To Prof. Salam, this is only the swing of history's pendulum.

He likes to tell how Michael the Scot left his native land in the 13th century to travel south to the Arab universities of Toledo and Cordova. Or how Mamun the Caliph of Baghdad in the 9th century, sent the Emperor of Byzantium a work concerning "a new path in mathematics called Algebra." Prof. Salam blames the Mongol invasions for the end of Islamic science. "The Mongols systematically destroyed libraries. Before printing, the destruction of a library meant the end of a tradition. When the libraries at Baghdad, Bukhara and Samarkand went up in flames, Islamic science was lost with them."

With men like Prof. Salam we are witnessing an exciting resurgence of Islamic science. Already his work has received recognition by the award of the "Atoms for Peace" prize—a fitting recompense for a man whose name, Abdus Salam, means "Servant of Peace."

With such a name he was almost pre-destined to work for the United Nations. He now has another dream, a world university of which the Trieste centre would be but one campus.

SUCH a university could meet a number of needs. There is already a strong movement for an institution devoted to the study of peace and disarmament which are at the heart of the problems that the United Nations must solve.

Secondly, institutes could be set up at the postgraduate level to conduct research in the basic sciences. Like his own at Trieste, Prof. Salam thinks that they should use the same built-in plug against the brain drain by requiring their participants to spend most of their time in their own countries.

And thirdly, Prof. Salam foresees international campuses with truly international faculties for the applied sciences. "They could be anywhere: Kenya for health sciences, particularly tropical diseases, Iran for petroleum and petro-chemicals, Nigeria or Latin America or Pakistan for agriculture, and so forth." Gaps left in the network of U.N. centres would be filled by federated universities and research institutes. "I'm after fifty campuses, not five or six," said Prof. Salam. "This must be truly a world university. Don't worry, it will come, certainly not tomorrow but certainly within twenty years."

On that note, I left Abdus Salam. His prediction is just a dream, but this disconcerting man of faith and science must be one of the world's most realistic dreamers... ■

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UNESCO NEWSROOM

A world approach to education

Mapping out a world-wide approach to the problems of education, encouraging national strategies and guiding international co-operation during the Second Development Decade—these are the aims of the International Commission for the Development of Education, recently set up by Unesco. The seven-member commission, headed by Mr. Edgar Faure, a former prime minister and education minister of France, will survey the state of education in the world today and its findings will serve as a guide to Unesco's work.

Unesco appeal for Euphrates Valley monuments

Unesco's Director-General, Mr. René Maheu, has called on universities, higher educational institutes and scientific organizations in 34 countries to help in safeguarding monuments and cultural sites in the Euphrates Valley. Some outstanding monuments and about 30 archaeological sites, ranging from neolithic to late Moslem, are due to be submerged by the waters of a dam now being built 170 kilometres from Aleppo in Syria. The appeal was made at the request of the Syrian Government, which is to present half of the finds made during archaeological excavations to the missions helping to carry them out.

Mexican algae cakes

Flour made from algae collected from ponds in Mexico was the main ingredient in some sugar-coated cakes recently sampled in Rome and pronounced "excellent" by members of the Food and Agriculture Organization's Protein Advisory Group. Algae protein, if made acceptable and mass-produced, could make a significant contribution to overcoming the world wide protein shortage.

Curbing record 'pirates'

International action to stop "pirates" from defrauding the record industry of millions of dollars every year is under way. "Pirate" industries, which produce records and cassette cartridges without paying royalties to the companies, artists and producers of the original recording, are so well entrenched in some countries that they are close to putting legitimate record industries out of business. A draft convention to protect record companies against these practices was approved recently by specialists from 41 countries meeting at Unesco H.Q. in Paris. The text will be given final approval at an inter-governmental conference later this year.

Egyptian temple for Netherlands

A 2,000 year old Egyptian temple, recently shipped in pieces to the Netherlands, is to be rebuilt in the courtyard of the Antiquities Museum at Leyden. The village of Taffeh, in upper Egypt, where the temple once stood, has disappeared beneath the lake behind the new Aswan High Dam, but the temple was dismantled and removed in 1960. It has been presented to the Netherlands by the U.A.R. in appreciation of its aid to the Unesco-sponsored international campaign that saved Abu Simbel and other Nubian temples from the waters of the Aswan High Dam. Other temples have been presented to the U.S.A., Italy and Spain.

The burden of military spending

A panel of 14 consultants appointed by U.N. Secretary-General U Thant is to report on the economic and social effects of world military spending later this year. U Thant has asked these specialists to propose effective ways to reduce and finally eliminate the dangers of the arms race and the economic burdens it imposes. Such savings, he has said, could be used to finance urgent programmes for economic and social progress during the Second Development Decade.

Mapping marine pollution

A world-wide investigation of marine pollution was proposed by the Consultative Council of the International Oceanographic Commission at a recent meeting in Bordeaux. Pollution studies are to be a major feature of a long term oceanic exploration and research programme that the Commission (set up by Unesco in 1960) is carrying out for the United Nations. Its first task would be to carry out surveys to establish baselines from which changes in the sea caused by pollution could be measured.

U.N. international university project

An international group comprising eight distinguished educators has been appointed by Unesco to submit recommendations for the creation of an international university under the auspices of the United Nations. The idea of setting up a university which would be truly international in character and aims was first proposed by U.N. Secretary-General U Thant in 1969. A report on the feasibility of the project, based on the Unesco group's recommendations and the views of international organizations, governments and universities, will be studied by Unesco's Executive Board later this year.

Young Finns to aid developing countries

Young Finnish university graduates are to work as associates of senior U.N. specialists on technical aid projects in the developing countries. Under a U.N.-Finnish agreement, they will be employed on economic and social development projects designed to make greater use of natural resources, improve urban and rural conditions, expand basic services and train specialized workers. By the end of 1970, young associate specialists from European countries were working in 30 countries of Africa, Asia and Latin America.

Water prospectors' school

Thirty students from four continents are learning how to find water and how to develop water resources at a course organized by the Hebrew University in Jerusalem. This six-month course in groundwater prospecting, hydrogeology and hydrology is sponsored by Unesco and the Organization of American States.

Volcanic research centre

Plans are under consideration for the setting up in Iceland of a centre for volcanic research. Iceland offers broad scope for studies in this field, since the frequency and variety of its volcanic activity are unequalled in the world.

FOOD FOR DEVELOPMENT

The World Food Programme was established jointly by the United Nations and the Food and Agriculture Organization in 1963. Its aim was not just to feed hungry people. Like other forms of aid—cash, equipment, expertise—sent to the developing countries, it is primarily intended as a long-term investment in their future. The commemorative stamp (left), issued last month by the U.N. Postal Administration in 13 cents (US) and Sw. Fr. 0.50 denominations, marks the efforts of the World Food Programme over the last eight years. As agent in France for the U.N. Postal Administration, Unesco's Philatelic Service stocks all U.N. stamps and first day covers currently on sale. For details write to the Unesco Philatelic Service, Unesco, Place de Fontenoy, Paris-7e.

Flashes...

■ *A Swedish electrical engineer has adapted the Braille alphabet so that it is easily intelligible to those with normal sight, can be used in a computer and remains comprehensible to the blind.*

■ *Between 1948 and 1968, over 20,000 persons benefited from Unesco fellowships, study and travel grants.*

■ *School textbooks used in the Fed. Rep. of Germany are examined systematically so as to eliminate all traces of prejudice against other countries and cultures.*

■ *Student enrolment in Brazil rose from 100,000 to 400,000 between 1963 and 1970. Australia's student population now includes some 12,000 young Asian men and women.*

Letters to the Editor

MAN AND VIOLENCE

Sir,

As a teenager in the final year of secondary school, I would like to say how useful I find the "Unesco Courier", culturally and educationally.

Just one example that comes to mind is the use we made in the classroom of your issue "Man and Violence" (August-September 1970). It served as the basis for study and discussions on man's aggressiveness, during our philosophy course.

In my view this was one of the most outstanding issues of the past three years. I was thus surprised to read the letter to the editor (January 1971) criticizing the amount of space it devoted to describing experiments aimed at deducing human nature from the behaviour of animals.

In view of the importance of research in this field, I feel that such studies are necessary since they help to clarify many aspects of a situation that affects us all, but to which we often prefer to close our eyes.

M. Laglaine
Royan, France

SCIENCE OF SURVIVAL

Sir,

Congratulations on the article "Peace Research—the Science of Survival" by Bert Röling (November 1970). It makes clear how imperative it is to analyse different ideas on the meanings of the same words, since misuses of concepts have many times led to war.

Among interesting features in other issues, I would like to mention the drawings of the formation of the mid-Atlantic Ridge (July 1970). Bravo for the December 1969 number on "The Sculpture of Vibrations", with its wonderful descriptions and illustrations. One suggestion: why not more issues on little-known countries? (I have in mind the feature you published on Mongolia in November 1969).

I hope your magazine will continue to show Man as the builder of the broad road of progress (to a world where the absurdities of today—poverty, hunger, social injustice, colonialism and man's systematic destruction of man will be things of the past).

Orfeu Santos
Lisbon, Portugal

'SECURITY COUNCIL' FOR NATURE AND MAN

Sir,

Your issue on Man and Violence (August-September 1970) dealt with problems vital to mankind, and I am sure it has brought you letters from readers the world over.

While reading the article, "Man, Killer of Nature", it occurred to me that Unesco should propose the calling of a special session of the U.N. General Assembly, to discuss the creation of a Council for the Protection of Nature and Mankind. This new body within the U.N. system could be vested with similar powers to the Security Council.

In my view, the U.N. International Conference on Problems of the Human Environment, to be held in Stockholm next year, could prepare material for discussion by the special session of the U.N. General Assembly referred to above.

M. Pravotorov
Moscow, U.S.S.R.

MORE VARIETY ?

Sir,

I am afraid I shall not be renewing my subscription to the "Unesco Courier".

My only criticism is that I would like you to present more subjects in each issue, instead of devoting nearly all of them to a single theme.

Eliane Jacquet
Limoges, France

INTERNATIONALLY-MINDED SCHOOLS

Sir,

In the article, "United World Colleges—a new concept in international education" (October 1970), we read with pleasure your account of a recent venture in the development of internationally-minded education. But surprisingly enough no mention was made of other "pioneer" experiments in this field, some of them dating back a quarter of a century or more.

Our own school, the College Cevenol International, at Chambon-sur-Lignon, in the Massif Central region of France, was founded in 1938. A secondary school for boys and girls aged between 11 and 19, it aims to give a "Christian education for peace and international understanding", notably through the efforts of its teaching staff and its 350 students who come from a score of countries on five continents.

With the support and encouragement of many organizations, including the International Fellowship of Reconciliation movement, it has long practised "modern" education in the widest sense of the term: co-education, student self-discipline and participation in management, contact with nature, and manual work closely linked to studies. It provides annual summer courses, including an international work camp and an International programme in languages, art and culture.

Your article rightly refers to problems that exist in France, for example, where only national diplomas are accepted. But one sign of progress it that two "pilot" schools in France and two others in the Fed. Rep. of Germany have now been authorized to follow programmes leading to a Franco-German baccalauréat. We ourselves are studying the possibility of preparing students for the "International Baccalauréat", a project also described in your article. It would, of course, be far better if such efforts were more co-ordinated so that those engaged in them would feel less isolated in their attempts to accomplish a task for which there will never be too many heads and hands.

A. Blancy
Headmaster, Cevenol College
Le Chambon-sur-Lignon, France

THE OTHER CULTURE

Sir,

In your issue "Cultural Policy—a Modern Dilemma" (January, 1971) the discussions on culture dealt only with those things that are external to man—culture as related to science, literature, history, politics, etc., in other words forms of culture that satisfy his physical, intellectual and social needs and desires.

But, as we are all aware, the continuing development of this culture does not stop men from hating and torturing one another.

There is another aspect of culture that seems to be neglected—the personal, inner culture, which consists in developing feelings of solidarity, altruism and love for others, in learning to understand and respect them even if they do not think as we do, in eradicating the poisonous roots of aggressivity, in helping those who suffer by giving freely of oneself.

In my view, a combination of these two aspects of culture would bring happiness and peace to mankind.

C.J. Grandin
Angers, France

THE PUBLIC AND MODERN ART

Sir,

We have received a copy of the Unesco Courier featuring the Toronto Inquiry into public attitudes towards modern art. More than interesting, we find that it may be very useful to us as a tool.

Earl Hatleberg
The Museum of Modern Art,
New York

JERUSALEM'S HISTORIC SITE

Sir,

While the news media are constantly bringing to our attention the political situation in the Middle East, few people realize that the region of Jerusalem is being systematically destroyed by building activity. Judging by the frantic rhythm at which new roads and apartment blocks are already being built on the hills surrounding the old city, it is easy to foresee that within a short time the exceptionally beautiful region will be transformed into an ugly sprawl of endless suburbs...

Jerusalem is just a small city in the Jordean Mountains. Yet it has played one of the most important roles any city has ever played in human history. Jerusalem is the Holy City of three religions and as a symbol the city has far greater importance that mere physical size can ever bestow on her. By surrounding the Old City with massive new developments, its fragile life will be crushed.

There are places where one simply does not build, and Jerusalem is such a place. The architecture of Jerusalem exists already—the Old City and its landscape creating a unique architectural space. In Jerusalem no construction, however good, can replace the architectural beauty it inevitably destroys.

N. S. Neumann
Ecole d'Architecture
Université Laval
Quebec, Canada

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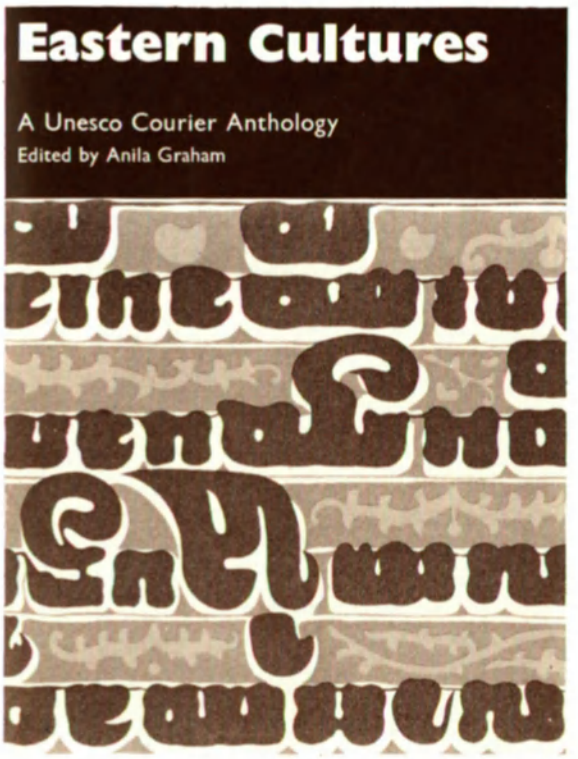

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Photo Museum of Bosnia-Hercegovina, Sarajevo.

MEDIEVAL TOMBSTONE ART OF YUGOSLAVIA

This tombstone figure with hands joined in prayer is a striking example of an original and still relatively unknown art in stone that flourished in medieval Yugoslavia. Some 30,000 tombs, sarcophagi and coffins decorated with figures, scenes from daily life and mysterious symbols still survive, often in remote mountain and forest cemeteries. This 15th-century limestone carving (150 cm. by 80 cm.) from Opravdic-Bratunac, is now in the National Museum of Bosnia-Hercegovina, at Sarajevo. (See article page 17).